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ABSTRACT

Colloquium participants were asked to make informed guesses about whether developing countries can grow and equitably distribute the food they need over the next decade, what the international development community should do to help in both production and distribution, and what role the United States should play in the development process. The 17 papers contained in the proceedings are: (1) "Forty Years of Food Aid and Development Assistance: What Have We Learned?" (D. Paarlberg); (2) "The Emerging Policy, Production, and Consumption Scenario" (S. Johnson); (3) "Prospects for Food Aid Needs and Global Food Supplies" (R. Trostle); (4) "Redefining National Security" (P. Johnston); (5) "Nutrition, Health, and Agricultural Development" (P. Pellet); (6) "Reevaluating Substance and Process Priorities in Development Assistance" (N. Brady); (7) "Market Development and Economic Development: Contrasts and Comparisons" (N. Denlinger); (8) "Food, Hunger, and Agricultural Issues" (D. Kleckner); (9) "International Agricultural Development: Benefits or Myths?" (L. Richardson); (10) "Using U.S. Food Surpluses for Development: Interaction of Food Aid with Other Forms of Foreign Assistance" (J. Mellor); (11) "Famine Prevention: Lessons from African Experience" (M. Williams); (12) "Women, Development, Equity, and Efficiency: In Pursuit of Constrained Bliss" (K. Cloud); (13) "Targeting Development Activities Toward Sustainable Agriculture" (R. Harwood); (14) "The Urgency of Institutional Changes for Agriculture in Less-Developed Countries, Newly Industrialized Countries, and Developed Countries" (G. Johnson); (15) "The Case for Refocusing on Development of Human Resources and Institutional Capacity" (R. Kleis); (16) "Tomorrow's Environment for Agricultural Development" (D. Avery); (17) "Development Assistance and Trade: The Way It Was, the Way It Is, and What the Difference Means" (L. Cesal; E. Rossmiller). (JB)

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FOOD, HUNGER, AND AGRICULTURAL ISSUES

Proceedings of a colloquium on future U.S. development assistance held at Winrock International Conference Center on February 17-19, 1988

Edited by
Deborah Clubb and Polly C. Ligon

Winrock International Institute for Agricultural Development
January 1989

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COLLOQUIUM SUMMARY

Jo Ann Pryor
Staff Writer, Winrock International

An American government official tells about going home to the family farm and being engaged by his brother in a discussion of international development. The official explained the rationale for development assistance, carefully laying out the argument that the future of American agriculture depends on third world markets. Finally the brother nodded in apparent agreement. "Well...yes," he said, pausing long enough for the official to believe his brother had been won, "but I just don't like that damn foreign aid."

Defending development can be a very touchy task. Communicating with the public—especially with American farmers—is not one of the development community's strong suits, yet the future of U.S. development efforts may hinge on public understanding and support.

In early 1988, Winrock hosted the first of 11 colloquia in an ambitious program sponsored by Michigan State University to examine U.S. involvement in international development. The goal of the program was to come up with specific recommendations for Congress and the new president on how to make development more effective.

Participants in each colloquium were to look at development through a different lens; one focused on the environment, another on population growth, another on science and technology, and so on. Winrock's lens was food production and hunger. The participants at this colloquium were asked to peer into the future and make informed guesses about whether third world countries can grow and equitably distribute the food they need over the next decade, what the international development community should and could do to help in both production and distribution, and what role the United States should play in all of this.

In addition to development leaders, Winrock invited representatives of two groups outside the mainstream of the development world—American farmers and the news media. Their participation was an acute, if initially uncomfortable, reminder to those in the mainstream that if they want public support they must nurture public understanding.

But even before the farm and media people began challenging other participants to think about how to communicate and con-

vince, the first two speakers on the agenda set the tone of the conference, illustrating the two most necessary elements of good communication: clarity and substance.

CLARITY AND SUBSTANCE

Don Paarlberg, professor emeritus at Purdue University, opened the colloquium with a story about how America's development efforts began in a president's apparent desire for rhetorical balance. "I need a fourth point," Harry Truman reportedly told his speechwriter as he reviewed an early draft of his inaugural address. And so, to Truman's call for creation of the United Nations, the Marshall Plan, and the North Atlantic Alliance was added "Point Four...a bold new program...to help the free peoples of the world, through their own efforts, to produce more food, more clothing, more materials for housing, and more mechanical power to lighten their burdens."

Reviewing 40 years of U.S. food aid and development assistance, Paarlberg concluded that despite periodic failures and a sometimes-unwieldy process, the program has been a success. The United States may have attempted to "address 100-year problems with 5-year plans, staffed with 2-year appointments, financed with annual appropriations," Paarlberg said, "but something must be working...because hunger is in retreat."

Paarlberg's challenge to the development community was to commit to a clear objective. If people are to commit themselves to the conquest of hunger, they must catch the vision, he said. If the development community hopes to marshal human energy against hunger, it must clearly define its objectives and be able to articulate them.

Uma Lele,* chief of the World Bank's special projects division and the second speaker on the agenda, agreed with Paarlberg's assessment that "something is working." But she carried the discussion a step beyond results to reasons. Why, she asked, have some countries developed more successfully than others? How much can donors be credited with the successes and failures of development in third world countries?

Lele has spent years applying those kinds of questions to the development experiences of a number of African nations. Too often, she said, donors make decisions based on assumptions of reality rather than on reality itself, something especially tempting in development—where any change takes years and where causes

*Uma Lele's comments are extracted from her colloquium presentation "A Comparative Analysis of Policies of Eight Major Foreign Assistance Donors on Agricultural Development in Six African Countries."

and effects cannot easily be untangled.

As an example she cited people who 20 years ago maintained that India's age would be a deterrent to development because there was no hope for change in the way people thought and acted. Some of those very people are today saying that India's age was its advantage and that Africa is a lost cause, in large part because development is hindered by the relative youth of its nations.

Because of the experience of her native country, India, Lele refuses to give up hope for Africa's development. But she believes that change is as necessary for donors as for African nations. There is, she says, a tremendous need for agreement among donors on the substance of what needs to be done in Africa and for coordination of foreign assistance based on that agreement.

Lele's challenge was for the development community to take more seriously the need for substance and for empirical evidence upon which to both base decisions and build public support.

A MEASURE OF AGREEMENT

In the next day and a half, 18 "heavyweights," leaders of international development and U.S. agriculture, took their turns at the podium. They talked about everything from primary health care to national security, from sustainable agriculture to food production and demand in the 1990s, from food aid to food trade.

In the discussions that followed each set of papers a measure of agreement was obvious on many issues. Most participants, for example, agreed that accelerated development in the less developed countries is both desirable and feasible, that the right kinds of development assistance are essential, and that the agricultural, employment-led growth is the best model for most of those countries.

They agreed that, though the development community has not taken full advantage of past experiences, it has learned some things from the last 40 years. One of those lessons is that each donor has unique strengths. The United States, for example, has demonstrated comparative advantages in training people and developing institutions such as national research systems and universities.

On the question of how to make assistance more effective, suggestions ran rampant: make agriculture more sustainable, synchronize U.S. agricultural and food policy with foreign policy, get more continuity and less fadism in development, create mechanisms that would allow USAID to continue working in graduate countries, involve U.S. agricultural interests in the development dialogue, and explore debt/equity swaps.

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WHAT'S THE STORY HERE?

Midway through the colloquium, a panel discussion entitled "What's the story here?" gave the development people a rare opportunity to see their work through the eyes of the news media.

Most of the public gets its idea of development from the media. But from the development community's perspective, the media isn't doing a very good job of reporting on the subject. "Why is it," asked one participant, "that all we hear about are third world debt problems? We don't hear about the fact that developing countries buy 40 percent of the goods and services the United States sells."

There are reasons development gets the kind of coverage it does, one of the media representatives said. Foremost is the competition for column inches and air time. For every story written there are 500 good ideas that no one has the time to follow up. The stories filed each week by *Time* magazine reporters throughout the world could fill 10 textbooks, but there are fewer than 50 pages of news in every issue. There is simply more news than media space or time.

Because the competition is so keen, events or subjects that are timely and easy to grasp and explain are more likely to receive coverage. But too often development is neither. The message of development can be complicated—not only because of the lack of empirical evidence to link projects with results, but also because development has become mired in jargon. Development literature and conversation are so encrusted that they must be translated before they can be understood by outsiders, even well-educated outsiders.

The media—like the public it serves—wants communication that is concrete and understandable, the reporters and farm representatives said. If the development community wants public support it will have to make its story clear. These "outsiders" suggested the development community start by resolving the recommendations of this series of colloquia into a one- or two-page statements of narrow, simply articulated goals and objectives.

WHY DO DEVELOPMENT?

In fact, much of the discussion before, as well as after, the media panel centered on the question of why the United States should do development at all.

The farmers and farm interests represented at the meeting reminded the other participants of two basic things the development community needs: clear goals and tough allies.

There was consensus that the goals must be sensible, based on both the real needs of developing countries and on what the United States can do best with the resources available. "We need do-able, attainable goals," said one participant, "and if they're going to be attainable, they've got to be not just humanistically but bureaucratically attainable."

Throughout the meeting, four kinds of goals were consistently named as essential.

First, humanitarian. People shouldn't go to bed hungry, the argument ran, and nations shouldn't be wasted by poverty.

Second, sheer survival of spaceship earth. The argument was that every passenger has a vested interest in how the ship runs. The effects of environmental degradation and abuse of natural resources don't stop at national borders.

Third, national interest. The primary argument here was that three- fourths of the earth's population lives in developing countries, a percentage that will continue to rise. Forty percent of all U.S. goods are now purchased by developing countries. The conclusion: the United States needs third world markets.

Fourth, national security. One participant suggested that the man who said he just doesn't like "that damn foreign aid" should be asked if he prefers foreign military assistance to development assistance, because one way or another, America will invest in security.

The suggestion that development needs strong allies as it faces Congress was translated into advice: "coalesce." Make coalitions with other groups that share parts—if not all—of development's vision.

The development leaders were warned that U.S. agriculture, especially, is a force that can be ignored only at development's peril. "Reach out to the farmers. They'll probably be resistant, but if you don't listen to them, you'll make enemies for your cause."

THE VISION

In his opening remarks Paarlberg told how in the early days of development, third world countries had no basis for believing that agricultural development and the conquest of hunger were achievable objectives. Lacking the vision, he said, they lacked the will. "How could we instill such visions in the minds of people who had neither witnessed such things nor thought them possible?"

As the meeting wound down, discussion came back to the question of how to achieve the ultimate development goal of defeating hunger. Lowell Hardin, professor of agricultural economics at

Purdue University, talked about the dream of some of development's pioneers 30 years ago.

"We hoped we could focus in on one tight, sharp goal like overcoming hunger and sell John Kennedy on the idea. He was young and aggressive and he wanted to make his mark. A group of scientists went in to talk with him. He sat in that rocking chair of his and rocked back and forth and finally he said, 'We're going to put a man on the moon.'

"What if he'd said, 'We're going to see that no one has to go to bed hungry'? Would we today be farther down the road toward eliminating hunger? We might."

PART 1

FOOD AID AND DEVELOPMENT ASSISTANCE EFFORTS: ANALYSIS OF THE PAST, SCENARIO FOR THE FUTURE

FORTY YEARS OF FOOD AID AND DEVELOPMENT ASSISTANCE: WHAT HAVE WE LEARNED?

Don Paarlberg
Professor Emeritus, Purdue University

Nearly 40 years ago President Truman, preparing his inaugural address, was given a draft drawn by his special counsel and speech writer, Clark Clifford. The story is told by Cabell Phillips in his book, *The Truman Presidency.* According to Phillips, the draft related to three matters: the United Nations, the Marshall Plan, and the North Atlantic Alliance. Truman liked the draft but it seemed in some way lacking.

"I need a fourth point," he said.

Clifford remembered a memo sent to him by a State Department aide who had the idea of providing technical assistance to the developing countries in accordance with a pattern that had been tried successfully on a small scale in Latin America. The idea was to overcome poverty and hunger by helping to lift the economies of these agricultural countries much as we were helping rebuild Europe under the Marshall Plan. The aide's superior had shown no interest in the proposal so he went higher and sent it to Clifford, who passed it to the President.

Truman liked the idea and incorporated it into his inaugural speech, without staffing out. Here is the pertinent language: "Fourth, we must embark on a bold new program...Our aim should be to help the free peoples of the world, through their own efforts, to produce more food, more clothing, more materials for housing, and more mechanical power to lighten their burdens."

This fourth point was well received. There was a growing awareness that the United States would do better if other countries were also doing better, that gross differences in well-being were as wrong between nations as between individuals, and that our affluence conferred on us some responsibility for helping the less fortunate.

Those were the lusty post-war years. We had survived World War II with our productive plant intact and thought we could do anything.

When the press called to learn what the fourth point was all about there was no background material and no ready title, banner,

or plan. It became *Point Four* and for a time it so remained. Later various names were applied. It was once part of the Mutual Security Administration. It became the Foreign Operations Administration, the International Cooperation Administration, and is now the U.S. Agency for International Development (USAID). The public, disregarding all these names, persists in calling it foreign aid.

There was another progression of nomenclature. The recipient nations, once pejoratively referred to as the *backward countries* or the *poor nations* were tabbed by Truman as the *underdeveloped countries.* Later they were further upgraded to *less developed, developing,* and *pre-industrial.* Now they are commonly referred to collectively by use of the innocuous term *third world* or, inaccurately, as *the South.* USAID, mindful of the fact that it is in these countries that its people serve, sometimes calls them *host countries.* In international circles they are called the *Group of 77* despite the fact that they number more than 100.

The American governmental initiative in international agricultural development was supplemented by the work of the great foundations, Ford, Rockefeller, and others, now including Winrock. The Food and Agriculture Organization of the United Nations (FAO) expanded its work. Public Law 480, known as Food For Peace, entered the effort. The World Bank with its huge resources, the International Research Network, and many private volunteer organizations addressed the food and agricultural problems of the third world.

Other countries came up with their own programs of international agricultural development. Do not forget that the developing countries themselves have made the greatest contribution to agricultural development. The FAO values this contribution at 90% of the total.

Private investment and entrepreneurship, indigenous and multinational, contributed significantly to the effort. It was a marshalling of money, people, and ideas, public and private, national and international, focused on the conquest of hunger, a mission newly perceived on a scale and in a manner unique in the world's history. International agricultural development and the conquest of hunger were ideas whose time had come. Apart from its accomplishments, the worldwide war on hunger spearheaded by Point Four was a great consciousness-raising event. Our ancient adversary, hunger, once deplored but inevitable, became a vulnerable enemy, to be challenged and overcome.

Point Four was controversial from the start. Internationalists, one-worlders, world federalists, philanthropists, and church people were for it. Opposed were the strong nationalists, cost-cutters, and farmers who feared setting up rival foreign exporters of farm products.

The American illusion was that the intended beneficiaries of Point Four would be enthusiastic about receiving this help. To some degree they were, but dissident groups within the developing countries raised objections. One was that the help was production-oriented, whereas allegedly the major problem was inequitable distribution. Another was that the programs involved an extension of the American political and economic systems concerning which there were deep doubts. Yet another was that the effort promoted capital-intensive and energy-intensive agriculture, for which the developing countries were not ready. Multinational firms were accused of exploitation. Recipient countries feared they might lose autonomy regarding their food policies.

Unlike the Agriculture Department, the Labor Department, and the Commerce Department, foreign aid had few real American constituents. Politicians were baffled in trying to assess the degree of support for it. Economists had no models that would accommodate the unpaid conveyance of technology, equipment, or personnel; economic theory had to do with exchange, not with gifts. Economists even balked at use of the word *gifts*, calling them *unrequited transfers*.

So Point Four and its successors were vigorously attacked and defended. When the agency had picked up as many scars and bruises as it could well carry, it was reorganized, redirected, or restaffed. This happened over and over. Or, if the problem was sufficiently grave, the agency's name was changed.

The question is whether the agency, having operated under its present name and format for a number of years, is now so battle-scarred and gun-shy that yet another reincarnation is appropriate, and if so, what form it should take.

In a sense, there was a predecessor for international agricultural development—the agricultural missionary movement. The missionaries operated on the hypothesis that the way to the soul was through the stomach. The Point Four people were aiming for the stomach itself, and for the heart. Some had the stomach itself as a sufficient objective, and some sought to reach the political heart by way of the stomach.

The techniques of the agricultural missionaries were not only to understand agricultural production but also to acquire competence in the native language, to immerse themselves in the local culture, and to commit themselves to long-term assignments. These principles were carried over only in part by the Point Four people. There are things still to be learned from the agricultural missionary movement. Point Four addressed a 100-year problem with 5-year plans, staffed with 2-year appointments, financed with annual appropriations.

To the original agricultural component of Point Four were added various related initiatives, among them institution-building, food distribution, capital investment, and family planning. The overall program had a large measure of defense support, so that the diplomatic and military aspects came to dominate the effort. The limited numbers of countries first involved were expanded until now foreign aid programs are in most of the developing countries, though the major share goes to Israel and Egypt.

The official development assistance programs of the United States, of which USAID is a part, are not large by comparison with other operations of the government, running generally around $5 to $8 billion annually, or between one-fourth and one-half of 1% of our gross national product. As the program came under increasing attack in the United States and as other developed nations expanded their own programs, the American effort declined relative to the world total. Altogether, the American share of assistance to the developing world has fallen to only 23% of the Organization for Economic Cooperation and Development total. As a share of gross national product our contribution has ranked 16th among the 17 industrialized nations.

We grew weary with well-doing.

But our effort was in a sense pioneering and the increased contributions of the other developed nations can be interpreted as an endorsement of our initiative.

We began, building on the successful technique of the Marshall Plan, with the classical idea of capital investment. In Europe, after the war, capital was the factor in critically short supply. All else was in place: the institutional structure, education, personnel, and perception that what had been might be restored.

But in the third world all these things were lacking—particularly the vision that agricultural development and the conquest of hunger were achievable. How could we instill such visions in the minds of people who had neither witnessed such things nor thought them possible?

In planning our effort we shifted from one strategy to another: capital investment, food first, balanced growth, big push, incremental change, institution-building, help to the leading sector, two-sector models, small is beautiful, intermediate technology, help to the poorest of the poor, use of the land grant college model, and aid through the private sector. We struggled with the question as to the desired level of technology; we sometimes sent overdeveloped scientists to underdeveloped countries and occasionally sent people who were long on zeal but short on skills.

In the development process do the recipient nations have to go through all the stages we experienced? If so, how could these

stages be compressed? Is it possible to leap-frog some of the intermediate stages and go from the ox-cart to the airplane? It may be possible for a single industry such as the poultry enterprise to go, to a limited extent, from the farm flock to a large modern commercial enterprise. But this cannot be done across the board. Development is organic, affecting the whole. It is not simply technical, confined to some single enterprise.

There was no generally accepted theory of economic development. Theories there were, in abundance. Adam Smith described the capitalistic system. T. W. Schultz offered his prescription for transforming traditional agriculture. Walt Rostow had his stages of growth, while Hayami and Ruttan published their induced innovation, all modifications and elaborations of Smith's model. Karl Marx explained development in terms of dialectical materialism, of which capitalism was only a passing phase, and an abhorrent one at that. Arnold Toynbee had a different approach altogether; he interpreted development in terms of challenge and response; thus tracing the rise of 21 civilizations during 6,000 years of history. But there was no consensus. The USAID people were like plant breeders charged with producing better varieties but lacking any agreed theory of genetics.

The Congress, wanting quick results, was impatient with the laggard response to the Point Four effort. Zealots for this or that approach locked in certain programs, projects, and ideologies, using the appropriations process as a discipline. The result was that the administrators of foreign aid had little latitude in the selection of projects or the allocations of funds.

Much of the problem arose from the lack of clear purpose. I have tallied 23 objectives, expressed or implied, many of them overlapping. Here they are, in no particular order:

- Feed the hungry.
- Alleviate poverty.
- Cut infant mortality.
- Reduce incidence of disease.
- Promote world peace.
- Achieve agrarian reform.
- Improve housing.
- Upgrade nutrition.
- Raise the educational level.
- Counter the military and diplomatic initiatives of the Soviet Union.
- Win friends for the United States.
- Avert revolution.
- Build democratic institutions.
- Promote economic growth.

- Influence the outcome of elections, at home and abroad.
- Dispose of agricultural surpluses.
- Find outlets for American agricultural products like bulgur, wheat, and fertilizer.
- Develop commercial trade in farm products.
- Increase the stock of basic agricultural knowledge.
- Strengthen the American Land Grant College System.
- Check the rate of population growth.
- Modernize agricultural policies in the third world.
- Protect bureaucratic jobs.

We were pioneering, feeling our way in an enterprise that was new, fumbling for all three of the elements necessary to a successful undertaking; a clear objective, an agreed strategy, and tactics of proven merit. As in many public efforts, controversy focused most sharply on the tactics, taking the form of arguments about personnel, projects, and funding. Thus the objective and the strategy were often obscured. When there is confusion about ends, controversy typically shifts to means because it is safer. Efforts to sharpen the focus were unavailing. No one of the objectives had enough political support to carry the program; the only way the undertaking could receive the necessary funding was to profess, if not deliver, support for them all. Advocates of one objective, say feeding the hungry, were incensed at the military support component. Those who wanted to move American surplus grain objected to lifting the agricultural capabilities of potential exporting rivals.

None of this controversy should be surprising. International exchanges of goods based on institutions of the market have been in place for perhaps 3,000 years, gaining effectiveness and acceptance by experience acquired over that period of time. How could we expect to develop, in 40 years, fully satisfactory institutions of unrequited transfers?

Some of the sharpest attacks on the program came from able and respected writers. Lord Peter Bauer, right-wing British doyen of development, wrote a diatribe against foreign aid titled *Reality and Rhetoric*. The Paddocks wrote *We Don't Know How*. Lappé and Collins despaired of progress unless capitalistic institutions were transformed into a socialistic model. Susan George wrote her critical work *How the Other Half Dies*. Some of the sharpest critics were members of Congress who, on trips abroad, might see a rusty USAID-supplied tractor in a field corner, idled for lack of spare parts, or observe some donated cheese being sold in the black market. From such highly visible instances it was easy for the critic to generalize about the entire program.

From 40 years of experience, one great lesson has been learned. Agricultural development is a slow process. In the United States, the surge in agricultural production did not really begin until the 1940s. This was 80 years after the establishment of the land grant colleges, 60 years after the experiment stations were set up, and 25 years after the beginning of the Extension Service. And this was in our own country, with a literate people, within our own language and culture, and with substantial programs. How could we expect quickly to transform, with limited resources, the agriculture of scores of countries with different languages, traditions, governments and cultures, many of whose people were unable to read? It is amazing that progress has been as great as it has.

There are two ways to deal with an undertaking that has problems. One way is to point out shortcomings in the hope that this will bring forth greater effort. The other way is to lift up successes, in the belief that such encouragement will increase confidence and produce better results. The country has dealt with USAID according to the first of these two alternatives; most of the comment about USAID has been critical. In the view of this observer, this is bad psychology.

It is time now to draw the positive side of the picture. Despite enormous obstacles, good things have happened in food and agriculture, worldwide. A 40-year period is long enough to authenticate this observation. Hunger, the ancient enemy, is in retreat. Agricultural science is on the march. It has achieved critical mass and now propagates its own next generation. Educational levels are improving. Various countries are developing their own systems of food security. Nutritional deficiencies are being reduced, death rates are falling, infant mortality is diminishing, and the life span is lengthened. These things can happen only if the agricultural sector is making advances.

Agriculture holds permissive power—and veto power—over the dimensions of human betterment. Third world agriculture has been able to keep a half step ahead of a rapid increase in population. Now, most important, the birth rate is declining. Nations that were on the borderline of hunger not so many years ago have escaped that enemy. This is true of countries on the Pacific rim: Japan, Taiwan, Korea, Hong Kong, Singapore, and Malaysia. Economic growth, agricultural advance, food aid to the unfortunate, and family planning are responsible. Two other large countries appear to be on the threshold of overcoming hunger: the People's Republic of China and the USSR. Even in India hope is replacing despair. Something must be working.

In all these countries are persons and groups who are hungry. But that should not blind us to the fact that general hunger in the

form of famine, once a chronic threat, is now in retreat, while it does persist in large areas, particularly in Africa. Hunger will make its last stand where agricultural science has not penetrated, where economic development lags, whether weather is most erratic, where the food needs of the unfortunate are ignored, where government is unstable, and where birthrates continue at their historic highs.

The objective set forth by U.S. Secretary of State Henry Kissinger at the 1974 world food conference, that within the next decade "no child will go to bed hungry," was not achieved. Victory in such absolute terms is not possible, nor will it be. But victory need not be total to be decisive.

Our ancient enemy, hunger, though still defiant, is in a fall-back position, as anyone will agree who has studied the history of hunger. The initiative has shifted to those who formerly thought only of defense. Not many people have yet perceived this shift in the terms of the battle. Among those who do are the people of the Hunger Project, who have put out their admirable book, factual and handsome, *Ending Hunger: An Idea Whose Time Has Come.*

What has been the role of the U.S. Agency for International Development in this conquest of hunger? No one can say with confidence. The economist with his nicely calculated "less and more" cannot measure it. The work of USAID is irretrievably blended and mixed with the work of other people and other agencies. There must be an element of faith in this work.

The United States, the wealthiest of all the nations, has a continuing role in helping the hungry people of the world. The moralist and the sociologist have responsibility in assessing this effort as well as does the economist, and the politician has the task of equating the judgement that comes from all these disciplines, not just one.

Marvelous things have been happening and USAID is on the team that has helped make them happen. President Eisenhower would tell his staff, "It's wonderful how much good you can do if you don't worry about who gets the credit." You will say that is a fine idea but not an adequate response for the administrator of USAID when he appears before the Congress in defense of his budget, and that is true.

It may well be that if and when a new administration takes office a year from now, some highly visible changes should be made in the Agency for International Development. A new name perhaps. Maybe a larger role for the private sector. A refining of objectives. A slimming down of the number of projects, some changes in the names on the doors, longer assignments, new slogans, some strategic retreat in those areas in which the agency

has trod on the toes of the powerful. Both the programs and their packaging likely will be changed.

To the zealot committed to the agency and its ways of doing, such changes might seem a compromise, a retreat on principle. But to the realist it would be the price paid for continued existence, a way of rallying and retaining the required political support. Commitment should be the objective, commitment to the conquest of hunger, much in the terms that President Truman stated it 40 years ago. For the strategy and the tactics, flexibility is appropriate.

It would make no more sense to reduce our commitment to international agricultural development after our 40 years of successful effort than it would to have cut back our national dedication to agricultural betterment in 1902, 40 years after it had been launched.

International agricultural development is one of those few areas in which ethical behavior and long-run enlightened self-interest are, to a large degree, compatible. In any restructuring of the agency, this idea should be kept in the forefront.

THE EMERGING POLICY, PRODUCTION, AND CONSUMPTION SCENARIO

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Development assistance policy in the United States is changing. Factors responsible for the change include international financial reform, updated information on the status of disadvantaged populations, differing theories of economic development, patterns of technology change and adoption, and the success of the countries assisted by the United States and other donors in improving their health, nutrition, and income status. Of course, U.S. development assistance will always be influenced by catastrophic situations, unexpected events, and changes in political priorities. However, the anticipated scenarios of the targeted countries will play a major role in the U.S. development assistance approach.

The purpose of this review of policy, production, and consumption is to assess the circumstances under which those responsible for U.S. development assistance programs will be establishing priorities. Over the past 20 years world agriculture has been on something of a roller coaster ride. Shortages, accesses, international price variability, and macroeconomic and financial instability have all contributed to a difficult planning environment for developing countries and donors.

Policy is addressed in this review for three reasons. First, it is increasingly recognized that the 20-year roller coaster ride in agricultural production, consumption, and prices has been largely due to agricultural, macroeconomic, and financial policy. Second, the General Agreement on Tariffs and Trade (GATT) round and international financial reform are ongoing and will likely influence the environment for development. Third, there is fuller recognition of the importance of domestic agricultural policies of the European Community, the United States, and other major exporters for the international prices of food commodities and traditional export crops faced by the developing countries.

LONG-TERM TRENDS

Perhaps the most striking feature of the long-term trend in world markets is the secular decline in real prices of major agricultural commodities. Figure 1, which contains an historical record of U.S. gulf port prices for soybeans, wheat, and corn, is indicative of this decline. Real prices of these commodities in 1986 were about one-third of their levels in the early 1970s. And, as suggested by projections from the Food and Agricultural Policy Research Institute (FAPRI), this trend will be continued.

This trend has double-edged implications for developing countries. Declining real prices of agricultural commodities reflect technological change and policies that have promoted increased output and efficiency in production agriculture. Alternatively, in developing countries where large shares of the populations are in agriculture, it is not likely that incomes will rise due to increases in real prices of primary agricultural commodities. Real income growth must come from other industries or sources.

In production, consumption, and stock levels for wheat and coarse grains, two factors are significant (see figures 2, 3, and 4). First, production and consumption are trending upward but at relatively modest rates. In figures 2 and 3, the broken lines indicate compound rates of growth of 2%. Second, historical world stock levels for these major food commodities have been 10% to 15% of consumption. In the recent past, these stock levels have been relatively high, 25% to 30% of consumption. However, from the normal ratio of stocks to consumption it is clear that variations in production due to policy and weather have the potential for exciting prices in international markets where price and income elasticities of demand are low.

Key factors which underlie the results provided in figures 1, 2, 3, and 4 are technology, population, resources, and policies outside the agricultural sector. Longer term trends and issues associated with these four areas are discussed briefly below.

Technology

A number of studies have documented the importance of the green revolution to food production and consumption in developing countries (Mellor and Johnston, 1984; Paulino and Mellor, 1984; Paulino, 1986; Parikh and Timms, 1986; World Bank, 1986). Evidence of technical change in the developed economies has been equally impressive. Yield level increases in the range of 1% to 1.5% per year are commonly estimated for major crops in developed economies (RCA, 1987). But, for the developing economies that

have even higher yield growth rates due to adoption of existing technologies for higher yielding crops, there is a potential problem.

For countries like Indonesia, which reached self-sufficiency in rice production in 1985, it is likely that the reservoir of new technologies for increasing agricultural productivity will be more limited in the future. Investments in technologies for food and export crops that are more country-specific may be required for sustaining productivity trends similar to those in the developed economies (Roundtable, 1988). Trends for future technical change in agriculture for developing and developed countries probably will be more similar. Productivity increases induced by change in policy and institutional structure are, however, quite possible in many developing countries.

Population

Food demand in developing economies is determined largely by population and income change. Using mainly income and population growth statistics (Devadoss et al., 1986; Meyers et al., 1986), analytical models can be constructed which explain demand in world markets for soybean, wheat, and feed grains. Income is the major link to the macroeconomic policy as it influences food consumption patterns and agricultural production (Mellor and Johnson, 1984; Bahrenian et al., 1986). Population growth in developing countries has been highly affected by policies of donor agencies and changing social priorities. But policy changes, improvements in medical technology, and adaptation of population growth rates will continue to be important in the equation balancing food consumption and production (Marks and Yetley, 1987; Rossmiller and Tutwiler, 1987). Rates of population growth in the range of 2% for developed countries and 2.5% to 3.5% for developing countries seem likely based on past trends (see figure 5).

Resources

The most uncertain factor for the future scenario may be resource trends. A number of recent studies indicate that some of the increase in production of food and agricultural commodities, particularly in developing countries, have occurred at the expense of natural resources (Bachman and Paulino, 1979; United Nations, 1986; Repetto, 1987). In effect, the countries are exploiting their nonrenewable resources to achieve rapid increases in production. The result may be a past rate of growth in production that cannot be sustained over the longer term. Productivity studies in the United States were conducted for the Resource Conservation Act and

incorporated estimates of technology and the importance of, for example, soil loss on productivity. Those studies suggest that for the United States productivity loss due to soil loss was not an immediate concern (RCA, 1986). However, in tropical environments where some developing countries are located, soils are considerably more frail than in the United States (Repetto, 1987).

In addition to soil erosion, other natural resource problems are attributed to current agricultural technologies. These involve largely off-site damages attributable to agricultural chemicals. The increased ability to detect the fate of agricultural chemicals and improved information about health risks from chemical residuals point to potential future problems (Johnson, 1986; Wolcott et al., 1988). These problems are particularly worrisome since the rapid gains in agricultural production experienced during the green revolution are not from improvements in plant genetics, but also from production techniques highly dependent on agricultural chemicals. (The nitrogen demand projection in figure 6 reflects the accelerated increase that has accompanied recent increases in agricultural production.)

External Policies

Policies external to agriculture have obvious impacts on food consumption patterns, hunger, and agricultural production and distribution systems. The most direct link to long-term issues is through the interaction of these external policies with agricultural policies in determining income levels for developing countries (Lee and Shane, 1985; Paarlberg, 1986; Mitchell, 1987; Langley et al., 1987). However, nonagricultural policies affecting international market prices deserve special attention. Due to international financial reform it will likely be more difficult for the developing countries to protect differences between domestic and international prices of staples than in the past. Major adjustments in food and agricultural policy may be required for countries bringing world and domestic prices in line. Also, many of the export crops of developing countries are governed by international marketing arrangements. These price-stabilizing and economic rent producing arrangements are threatened by the worldwide movement to policies that involve less market distortion.

AGRICULTURAL POLICY

Even in the short term, the aspects of agricultural policy most likely to affect the developing countries are largely external. Clearly, developing countries will continually change their domestic agricultural and food production policies. However, these policies will likely be changed in response to external stimuli. In particular, the developing countries are generally small agents in international commodity markets. But domestic agricultural policy changes in major trading countries that affect these international markets have far-reaching impacts for the developing countries. Three such policies are the GATT round, financial reform, and the domestic agricultural policies of developed countries that are major participants in international commodity agricultural markets.

GATT Round

A major feature of the proposals that have been tabled for the multilateral code to be developed in this GATT round is the idea of *decoupling*. Agriculture is included as was agreed in Punte del Este (GATT, 1986; Hathaway, 1987). Currently, a number of analytical exercises are under way to calculate proxy measures for the distortions implied by the current agricultural policies of the GATT round participants. Many developed countries, like less developed countries, have elected to make income transfers to rural populations and(or) other segments of society through price distortions.

These price distorting instruments are surprisingly efficient when the deadweight welfare losses and the amount of income transferred are compared (Choi and Johnson, 1988). But these efficiency calculations are on a single market basis. The countries bound by the GATT code are to modify domestic agricultural policies so that they are more decoupled. Then the associated income transfers will be more neutral for production, trade, and consumption. Currently, the calculations being made to index these distortions are broad in scope, including such things as research and development for agriculture, rural development, and farm financial services (Miner, 1988). Realistically, however, it would appear that only policies more directly related to production, consumption, and trade, such as price supports, export assistance, and production quotas, will be included in the GATT agreement.

The GATT round will be concluded in approximately 4 years. If the decoupling policies or anything like the proposals that were tabled by the United States and the participants with similar views are adopted, significant modifications in international agricultural markets and food production and distribution systems will occur

(Hathaway, 1987). A general conclusion of most of the free trade studies that have been undertaken is that prices of major food grains (and in some cases oilseeds) will increase if the subsidies to agriculture, particularly in the developed countries, are decoupled (Meyers et al., 1987).

Financial Reform

The debt situation and the economic reforms that have been adopted as a result of it are influential factors for domestic agriculture and food policies of developing countries (Bretton Woods, 1986; Rosensweig et al., 1986; Wharton, 1987). Strong pressures are being applied to realign currencies, reduce government budget outlays and, more generally, position major debtor countries to repay loans. An interesting consequence of this restructuring is that the flow of funds from developed countries to developing countries has been reversed (see table 1). The result is reduced funds for domestic investment to improve food production and stimulate economic growth.

Domestic Policies of Large Exporters

The Food Security Act of 1985 and the Common Agricultural Policy for the European Community have and are having major impacts on international markets in which developing countries participate. The Food Security Act of 1985 moved large stocks of U.S. agricultural commodities onto world markets and significantly depressed prices. Developing countries which had been concerned about food security and participation in international markets were suddenly faced with external prices for major food commodities that were considerably lower than projected.

The depressed international prices during the past 2 years have caused a number of developing countries to reconsider their priorities (Roundtable, 1988). At the same time, aggressive export policies of the United States have significantly decreased stocks. In fact, stocks are now at "through put levels" for many of the major agricultural commodities, implying intermediate term price strength even with normal weather conditions. An additional major area of policy uncertainty involves the planned economies. Agricultural reform in the Soviet Union and developments in China have and will perhaps continue to influence prices in international commodity markets.

PRODUCTION

For the intermediate term scenario, production is driven by technology, resources, and policy. Production levels in the short term, 5 to 10 years, will be driven primarily by policy. Trend yield levels are used in the analysis of production developed by FAPRI (1988). Rates of growth in production are on the order of 1% to 2%. Technology is assumed to continue to develop and be adapted at rates similar to those experienced by the developed countries during the past 15 years.

For natural resources, the situation is more uncertain. In the United States, for example, resource-driven policies will have idled 45 million cropland acres by 1990. If the U.S. situation is indicative of the situation in other major exporting countries, concerns about natural resources may begin to have increasing impacts on domestic production levels and prices. Unfortunately, these changes in environmental policy are difficult to predict. Rapid changes could occur on the basis of relatively limited new information on the environmental consequences of current agricultural production systems.

Large amounts of cropland are idle in many of the major producing countries. These idle lands are a result of either supply control policy or "abnormally low" policy-induced prices. Without the current supply management policies of the developed countries, significant adjustments in production levels would occur by region of the world. Since the United States, European Community, Soviet Union, and other major participants in international agricultural commodity markets are considering and undergoing policy change, it is highly important that the policy assumptions be identified and directly integrated in the emerging scenario.

CONSUMPTION

For the short-term scenario, consumption is viewed as driven by technology, demographics, and policy. As with production, the most interesting of the short-term consumption impacts relate to policy. Technology influences consumption in a number of ways which may seem more subtle than in the case of production. Changing food supplies, changing relative prices, improved storage, and other technological effects alter consumption patterns. However, these effects are more long term in nature. These types of technology effects were not factored directly into the emerging scenario.

Demographics are incorporated in the emerging scenario through population growth. Modest population growth consistent with adjustment in population policy and population patterns of the 1980s seems most likely for the near term future. The scenario is then for populations growing at a slower rate than in the 1960s and 1970s. As the populations grow more slowly, they will age. Thus, in countries like Indonesia which have relatively modest growth of population currently, food consumption requirements will increase much more rapidly. These scaling effects (differentiating adult and child consumption levels) are only beginning to be incorporated in the food and agricultural policy planning of developing countries. The view seems to be that if populations grow more slowly, food requirements will be more manageable. Simple calculations using recommended requirements of different age and sex groups show, however, that the growth in food requirements will slow long after the population growth has slowed or stabilized in many of the developing countries.

Prices and incomes which determine consumption are, in turn, conditioned by agricultural and trade policies and macroeconomic outcomes. Given the world debt situation, it seems unlikely—unless there is major relief—that incomes in developing economies can grow rapidly. Investment will be slowed by the instability in the international financial markets. The debt situation for many developing countries is significant and will require a large share of export earnings. It is difficult in this situation to project economic growth rates much in excess of those currently experienced. The implication is that food demand will grow slowly and will be conditioned by prices at or near current levels and that incomes will grow at modest rates.

An interesting policy issue for consumption involves food assistance programs. Developing countries are showing widespread interest in adjusting domestic food assistance programs. One reason is that prices of agricultural commodities and staple foods in developing countries are being brought to world market levels in order to comply with international financial reform. Pricing systems had been used as mechanisms for providing income transfers or food assistance to the poor. In absence of these price-related policy instruments, alternatives are being considered. If the countries adhere to the reforms and unless there is significant growth in income and improvement in the income distribution, massive direct food assistance programs will be required if the real incomes of the poor are to be maintained and the prevalence of hunger and malnutrition is to be reduced.

THE EMERGING SCENARIO

The emerging scenario for policy, production, and consumption of agricultural commodities will be highly conditioned by macroeconomic policies and the domestic agricultural policies of the major trading countries. The results presented are from a recent exercise (CARD/FAPRI, 1988). The projections are for 10 years and conditioned by a macroeconomics scenario from Wharton Econometrics Associates and detailed assumptions on the domestic agricultural policies of the major participants in international markets for key agricultural commodities.

The macroeconomic projection is for modest rates of growth in the developed economies. The scenario is, however, more positive for Africa and Latin America. Average growth rates of around 3% are projected for this group of countries. These rates of growth are higher than those experienced in the most recent 2 or 3 years. Rates of growth, as well as other factors, reflect how the debt situation will be handled. For the Pacific Rim countries, annual rates of growth lower than those of the late 1970s but higher than those experienced in recent years are included, 5% to 6%. The U.S. currency holds at about current levels for developed countries and increases in value relative to the currencies of the developing countries.

Policies for agriculture in the major trading countries are incorporated directly in the model. The equilibrium process in the models for these countries are different depending on whether they are planned or market economies. For the European Community, the continuation of current policies and variable levy, in particular, is presumed. For the United States, it is assumed that another agricultural policy similar to the Food Security Act of 1985 will be passed in 1990. Target prices and loan rates will be continued at existing levels, and additional land will be cropped as acreage reduction provisions are reduced and higher market prices cause lower participation in the voluntary commodity programs.

The emerging scenario is reviewed for prices, trade, supply and use for an example commodity, and government cost for the United States. Government cost for the United States has been included since it has contributed in part to the current rethinking of agricultural development assistance policy. Also, the cost of the program will influence the United States in staying the course with policies like the Food Security Act of 1985, in part designed to encourage policy reform for agriculture in developed countries.

U.S. gulf port prices projections for wheat, soybeans, and corn reflect the general conditions in world markets as conditioned by the model under the macro and domestic agricultural policy assumptions (see figure 1). Prices stabilize in 1988-1989 and hold

through the end of the projection period. Soybean and oilseeds prices are higher, largely due to the impact of the acreage reduction programs for corn in the United States. Prices of rice and cotton (not shown in figure 1), which were covered by the marketing loan in the Food Security Act of 1985, have rebounded rapidly from the low levels of 1986. These price projections are more optimistic than those developed in a similar exercise last year (CARD/FAPRI, 1987). Due to the impact of the Export Development Program on stocks, significant revisions in stocks, consumption, and production level estimates by the USDA, and a more rapid than projected reduction in the exchange rate making U.S. commodity prices even lower relative to those of other countries in world markets, stocks have been reduced.

Trade results are summarized for three commodities: feed grains, soybeans (soybean equivalents), and wheat (see figures 7, 8, and 9). The figures are organized to show the shares of the market accounted for by developing, developed, and centrally planned economies. Two factors emerge from these three figures. First, markets in the developing countries are growing rapidly, largely due to population growth and the optimistic income scenario. Second, there is growth in the planned economies' imports. Here, the cause of growth is less certain. Imports are largely estimated as residuals with production and consumption driven by persistence. Thus, changes in policies, like the reforms currently under way in the Soviet Union, could dramatically alter the results.

As suggested by the supply and use table for wheat graphed in figure 10, the U.S. situation is changing. Observe that the stock levels have decreased dramatically and are nearly in line with longer term averages. This decrease in stock levels is one of the reasons the real wheat prices shown in figure 1 are stabilizing. These prices are, however, highly dependent on policy. For example, in the United States approximately one-third of the wheat acreage is currently idled by government programs. Changes in the government program could significantly alter production, stocks, and international market price levels for wheat. Similar results were for the other major food and coarse grains.

The last feature of the emerging scenario is the government cost for the United States (see figure 11). The cost of farm programs is projected to decrease by $15 billion from the $24 to $25 billion in 1987. These reduced costs are largely due to the lower costs of operating the price support program. Normal prices for most of the commodities are currently, and in the out-period, at or above the loan rates. Budget pressure on the U.S. agricultural program will be lessened. The past budget pressure may be one of the factors that has caused producers and commodity associations to become concerned about agricultural development assistance.

SPECIAL CONCERNS

Changes in economic and political conditions could cause the emerging scenario to reverse or change. These five concerns for change relate more to the conditions driving the modeling system from which the emerging scenario was developed than to the models themselves. When we have been wrong in the past with our CARD/FAPRI projections, we have been wrong more because of assumptions on policy and external factors than because of the modeling system, which although obviously in continual need of improvement, has adequately characterized the situation for making the projections.

Policy

As emphasized throughout, the emerging scenario is not characterized by consumption demands that cannot be met by technology and production levels or population growth rates that give rise to alarm about future food requirements. Instead it is governed by domestic policies of major trading countries, domestic agricultural policies of the developing countries, food assistance policies, and trade or multilateral policies. The emerging scenario is one in which policy actions will have major influences on the economic fortunes of the developing countries and on the success of their own domestic agricultural and food policies. The theme for policy change, should it occur, is toward reducing distortions in agricultural markets. This will affect the developing countries, ultimately raising prices since agriculture has been highly subsidized in the developed exporting countries. But the price rises may be slow and erratic. And they will depend as well on the growth rates of the developing countries. GATT and decoupling policies are a major policy uncertainty. Developing countries may be exempt in one way or another from these multilateral agreements. However, impact on those participating will be heavily felt in the international agricultural commodity markets and perhaps in the markets for the agricultural commodities that have been used traditionally by the developing countries for export earnings.

Macroeconomic Conditions

The macroeconomic conditions presumed for the scenario are optimistic. More rapid economic growth rates could stimulate sharp increases in international prices. Slower growth rates will not reduce these prices significantly since significant commodity stock

levels and idle acreage exists. Choices made by the United States and other developing countries in dealing with the deficit problems will have an influence on international financial markets. The course of policy is difficult to predict. For example, if the United States turns to inflation as a way of eliminating the deficit, it should cause further reevaluations of the currency and associated adjustments in international financial markets.

Planned Economies

The poorest information for the emerging scenario is from the planned economies. China and Russia account for major portions of world production, consumption, and trade in the major agricultural commodities. Both countries are undergoing significant economic reform. If the reform in Russia produces productivity results similar to those in China, significant changes could occur in the feed grains, wheat, and oilseeds markets. The scenario assumes that the response to these changes will be relatively slow in Russia. If the reform in Russia increases in pace, the question for the scenario will be a balancing of the growth in income and increased food demand against increases in agricultural production through increased efficiency and their consequences for world markets and prices.

World Debt

The world debt situation continues as a major concern for developing countries. Simple calculations of debt service requirements relative to foreign exchange availability for many of the more indebted countries suggest that if the debt commitments are met, there will be little investment. The consequence may be growth rates for the developing countries lower than have been used for the analysis. There is evidence that the debt problem is being handled in ways that involve mark-downs. The extent of these policies and the movements of capital implied by debt repayment will be important in conditioning the growth of the developing countries, their income levels, and their food consumption and agricultural production patterns.

Food Assistance

Food assistance deserves special attention. Clearly, if economies are to be politically stable and the traditional policy instruments for transferring income to the poor have been eliminated through international price, monetary, and policy reform, alterna-

tives must be developed. The most likely alternatives are various types of targeted food and income assistance programs. These food assistance programs (food stamps, commodity distribution and feeding) promise to become larger in scope, with broad implications for their financing, concessionary sales of feed and food grains by the United States and other developed countries and, of course, their impacts on the agricultural production and consumption patterns in the developing countries.

Table 1. Debt indicators for selected countries.

Country	Current account deficit 1970 to 1980 (% of 1981 GDP*)	Debt-GDP ratio 1981	Debt-export ratio 1981	Debt service ratio 1980 to 1983
Latin America				
Argentina	2.3	31.6	334.7	214.9
Brazil	22.8	26.1	298.7	132.6
Chile	19.8	47.6	290.0	153.3
Mexico	13.9	30.9	258.8	161.8
Peru	19.3	44.7	223.5	122.2
Venezuela	-7.5	42.1	134.0	117.8
Weighted average	13.6	31.3	271.5	153.8
Colombia	0.4	21.9	182.9	103.8
East Asia				
Indonesia	0.6	24.1	87.1	n.a.
Korea	24.6	27.6	76.6	90.1
Malaysia	-2.0	27.8	51.8	16.9
Thailand	22.4	25.7	103.1	58.1
Weighted average	11.9	25.9	82.1	61.7
Philippines	18.3	40.6	214.6	152.7

Source: From table 4, Sachs, 1985.
*GDP = gross domestic product.

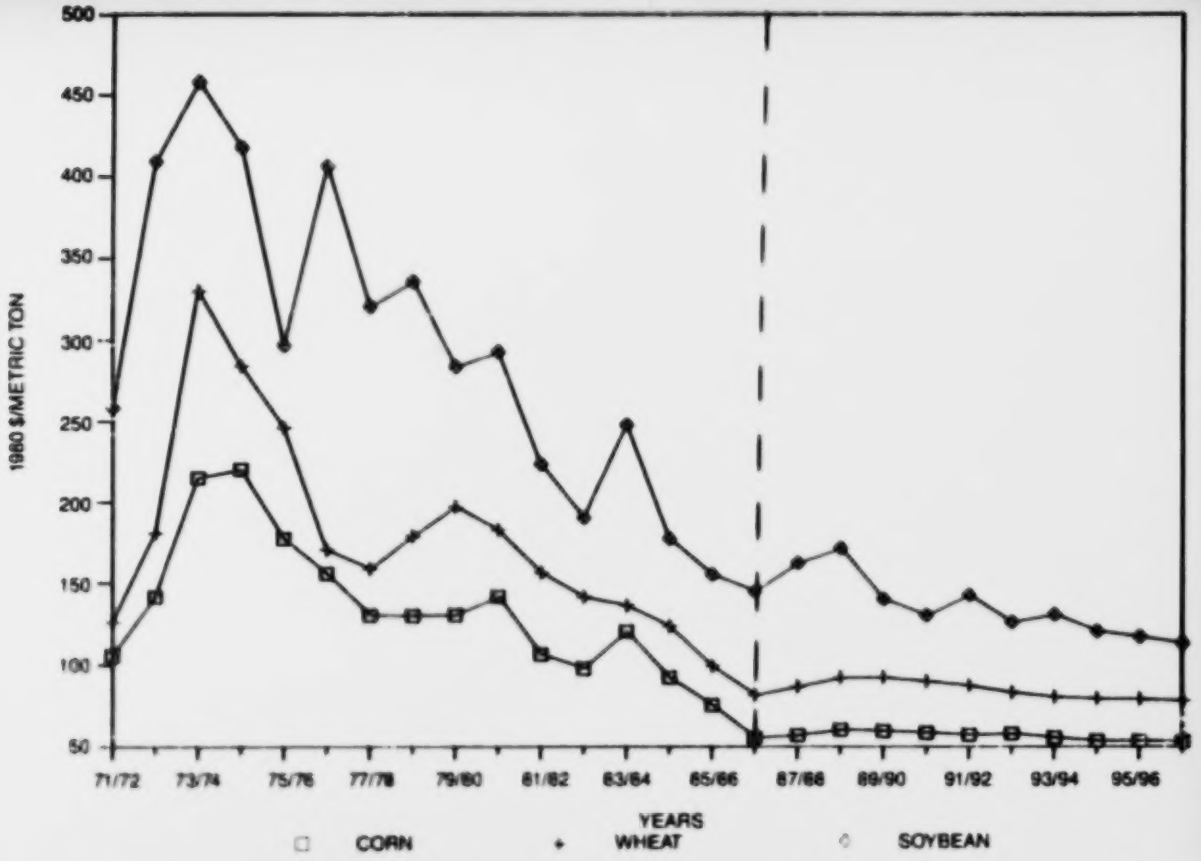

Figure 1. Real U.S. gulf port prices. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

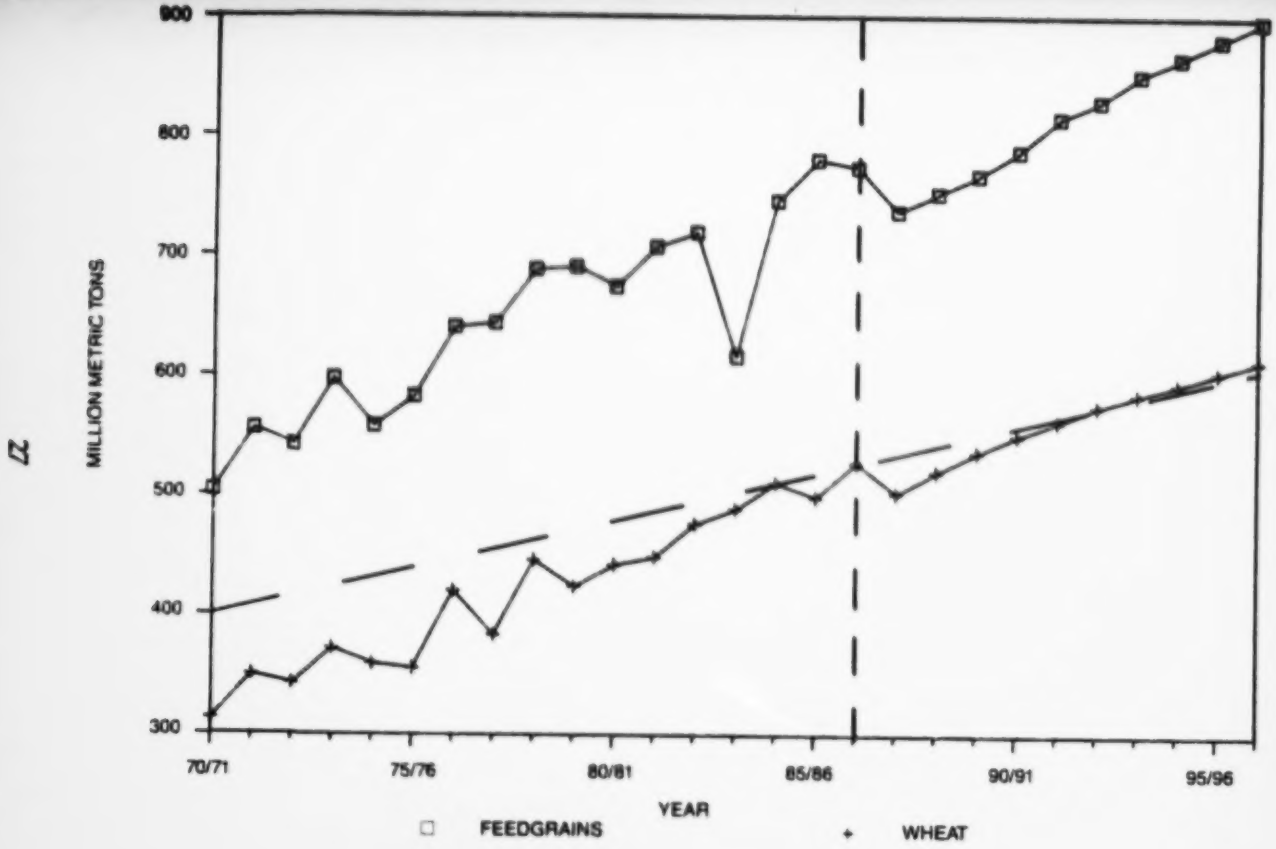

Figure 2. World grain production. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

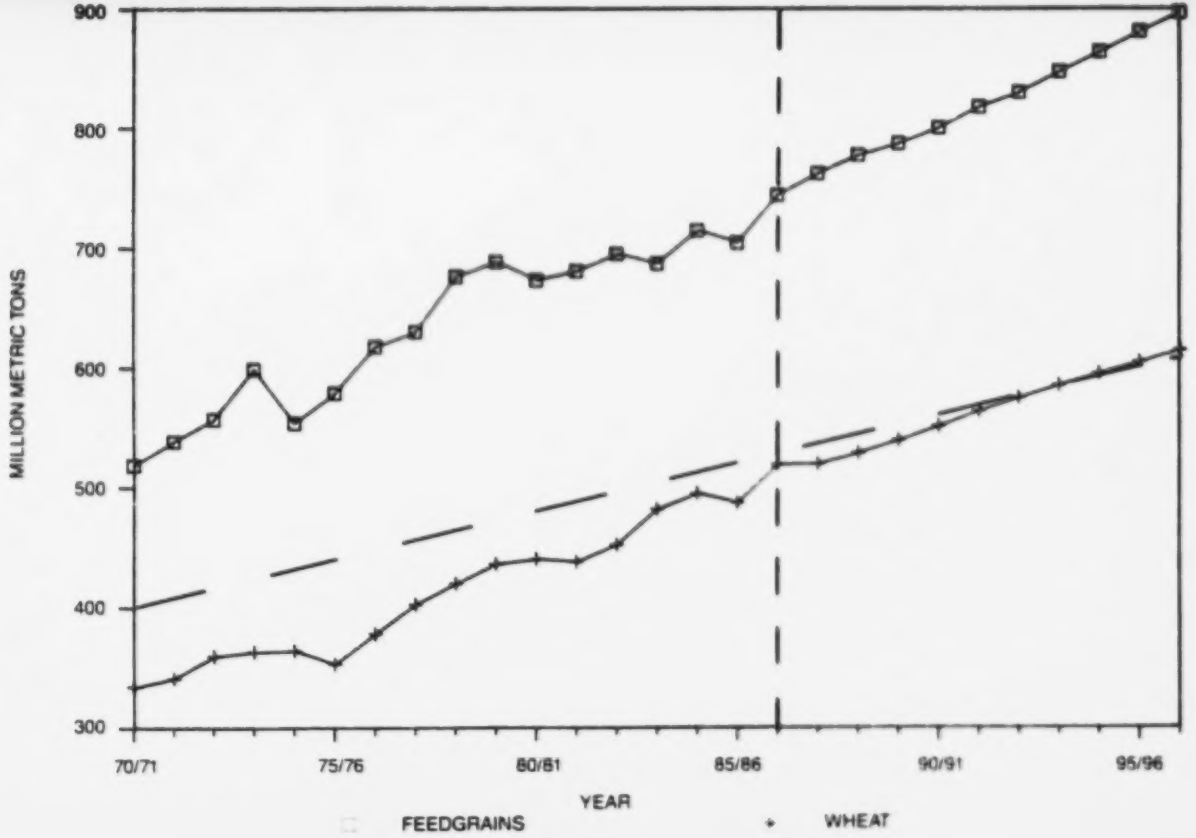

Figure 3. World grains utilization. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

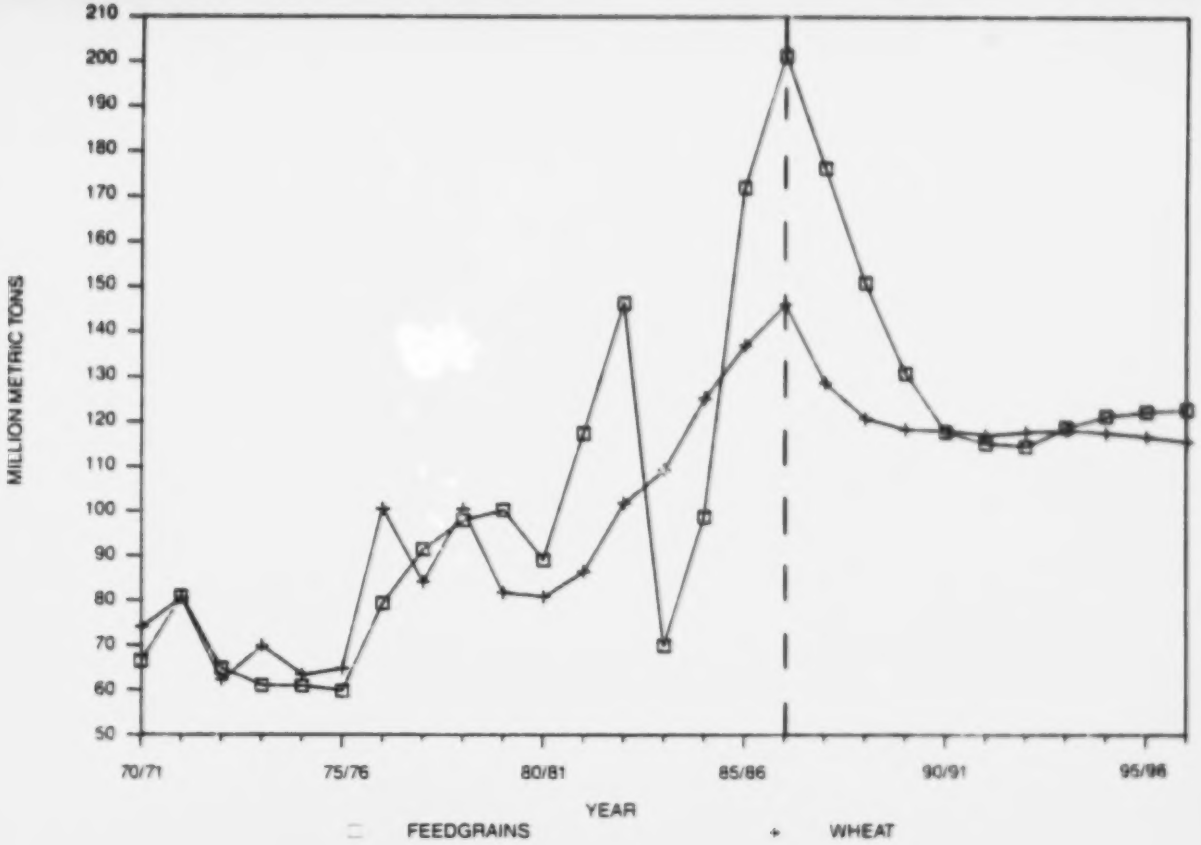

Figure 4. World grains ending stocks. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

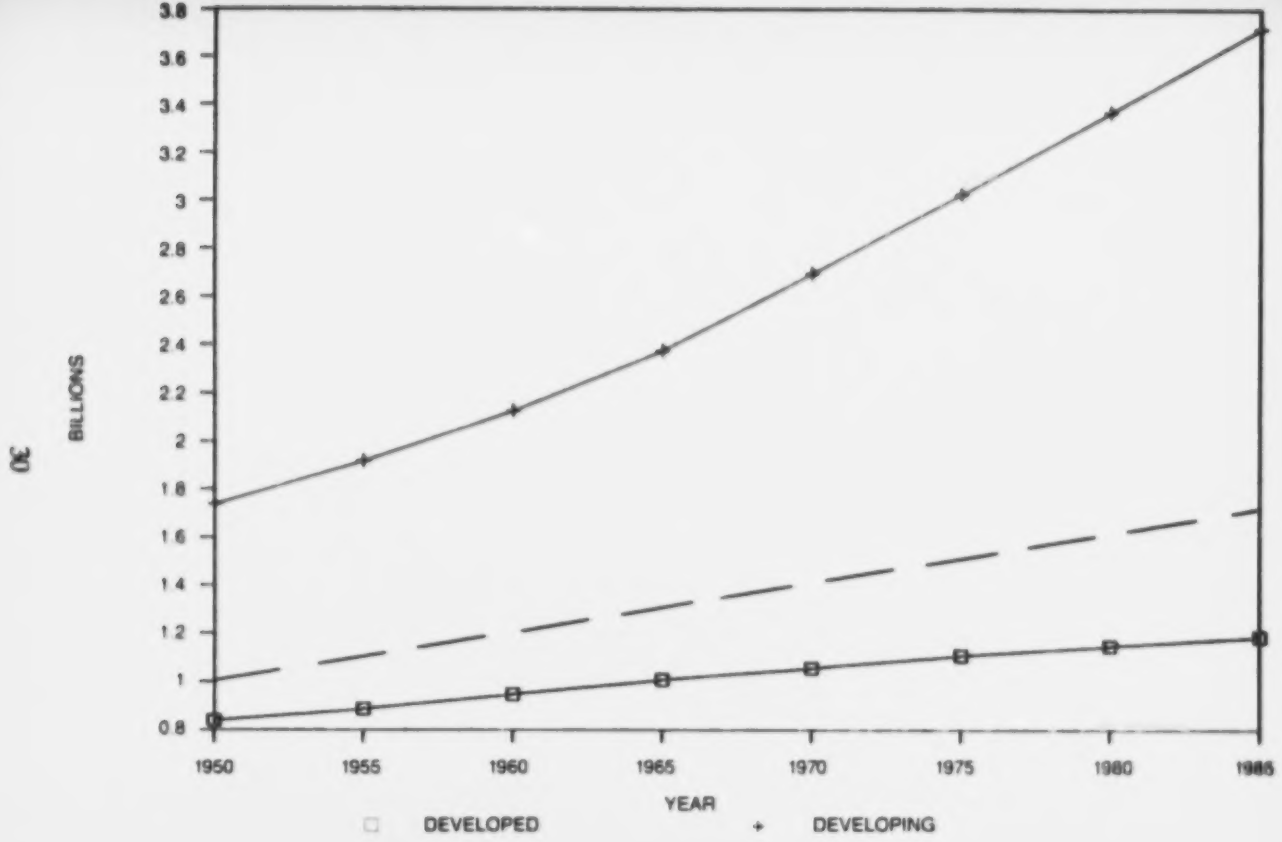

Figure 5. World population. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

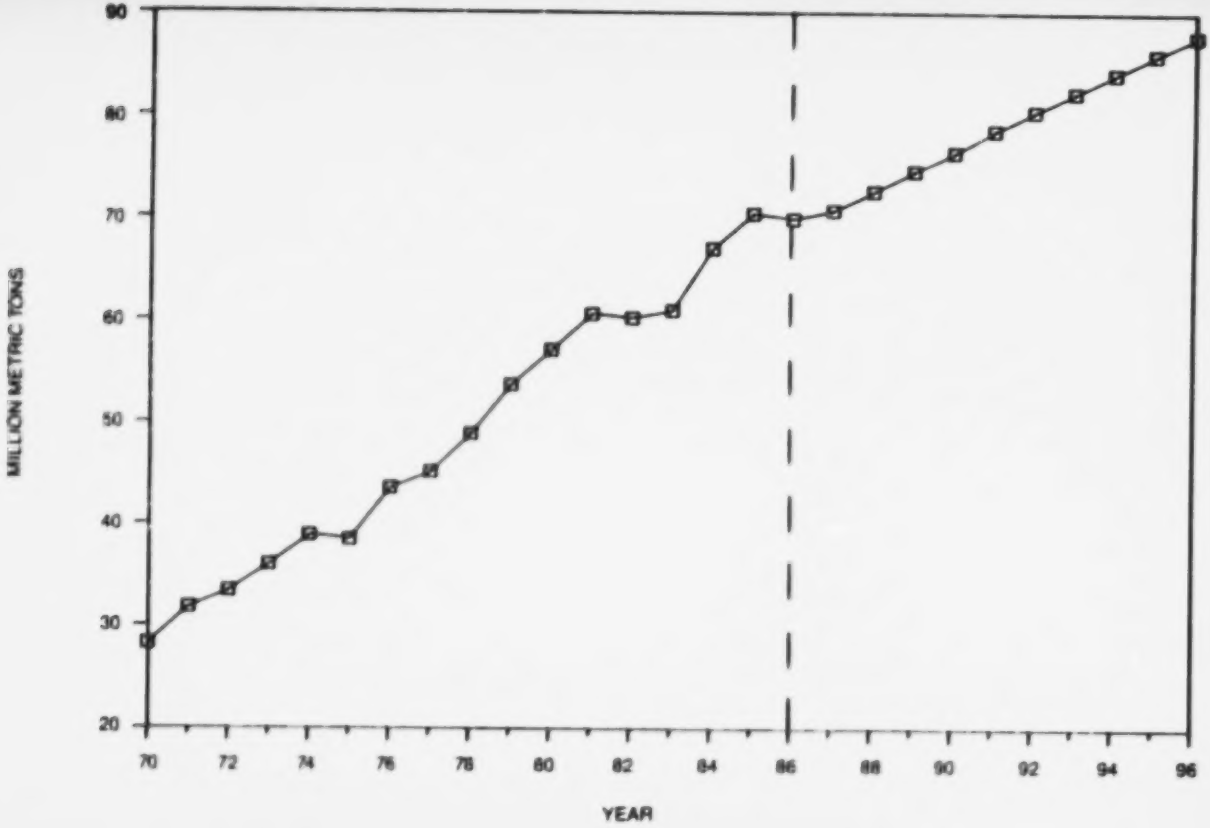

Figure 6. World nitrogen demand. (Source: Wharton Econometrics Associated Data Base, 1988.)

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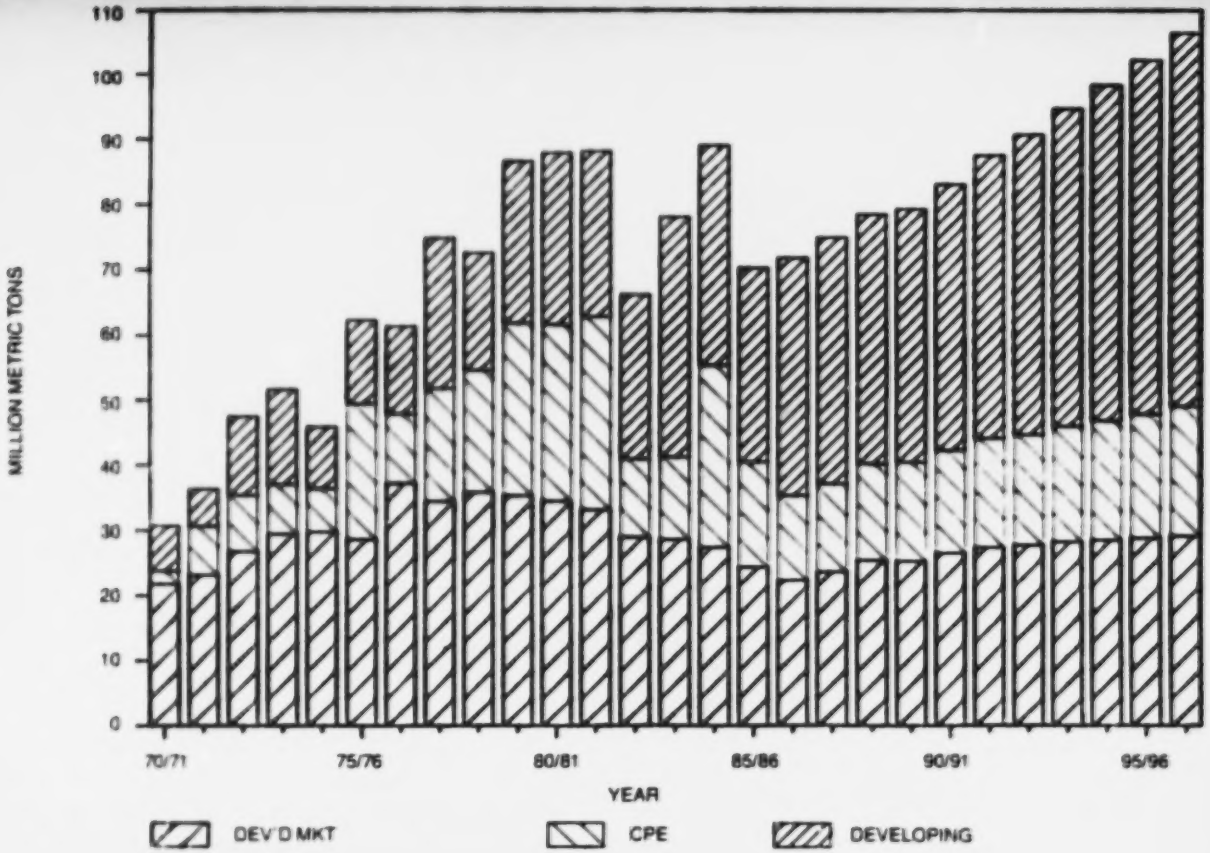

Figure 7. Feedgrains imports. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

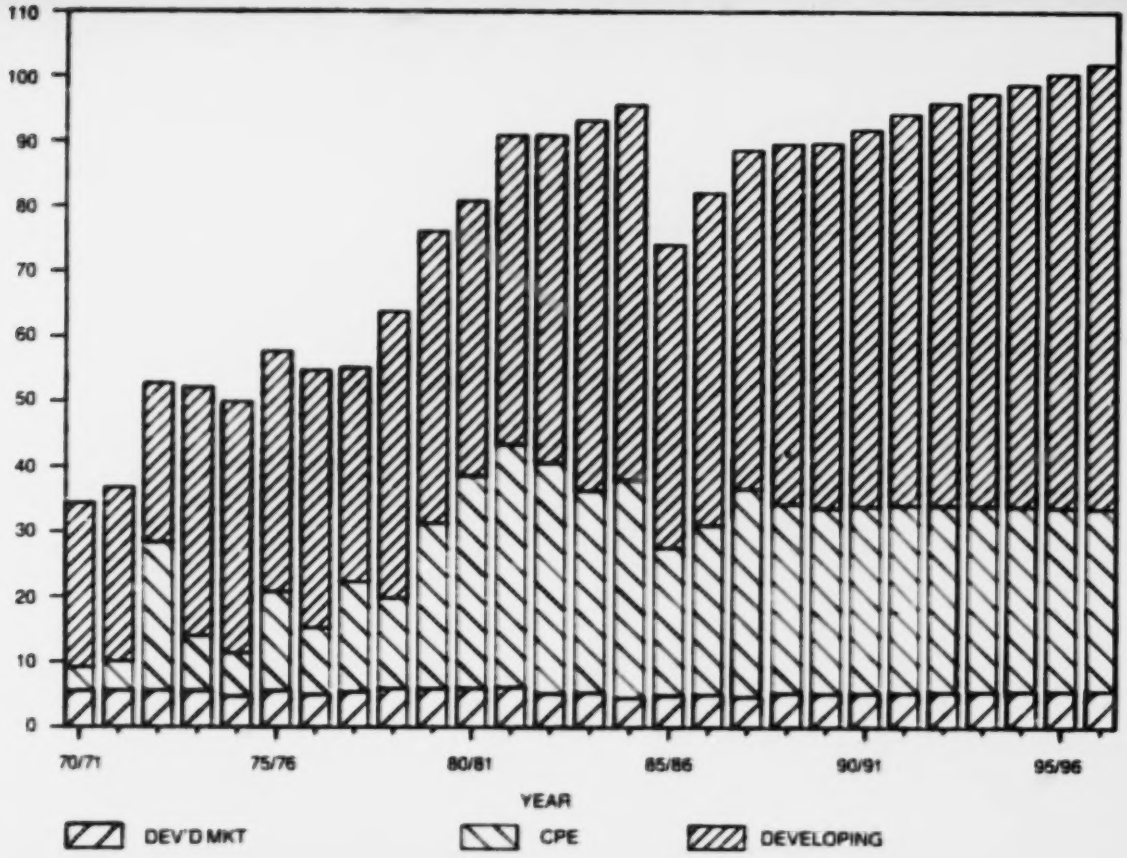

Figure 8. Wheat imports by region. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

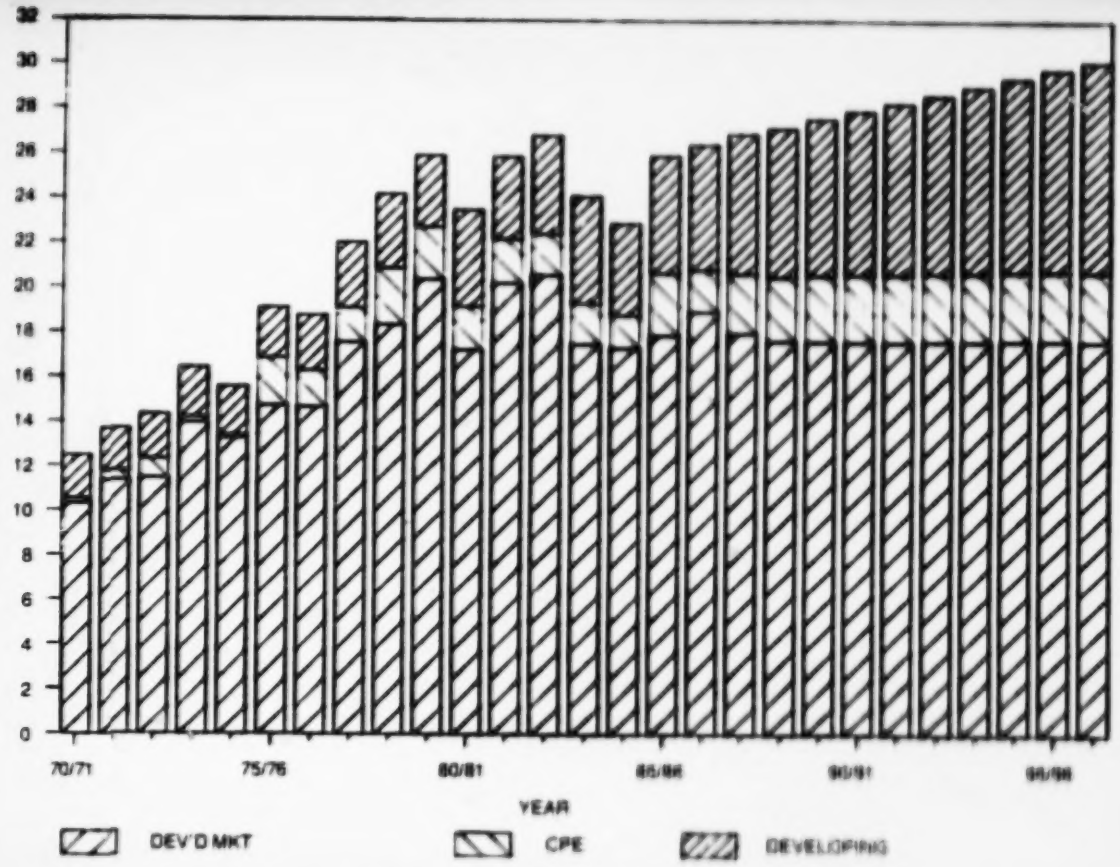

Figure 9. Soybean imports by region. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

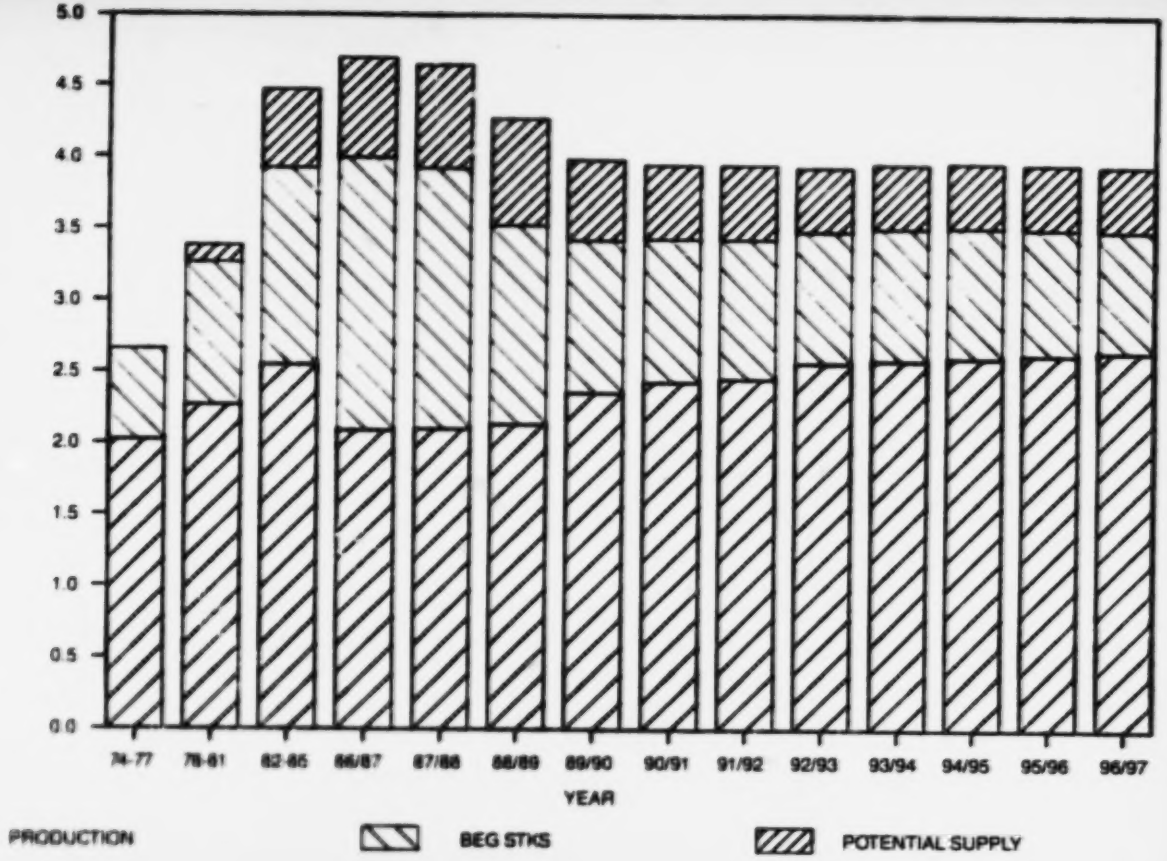

Figure 10. Wheat supply. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

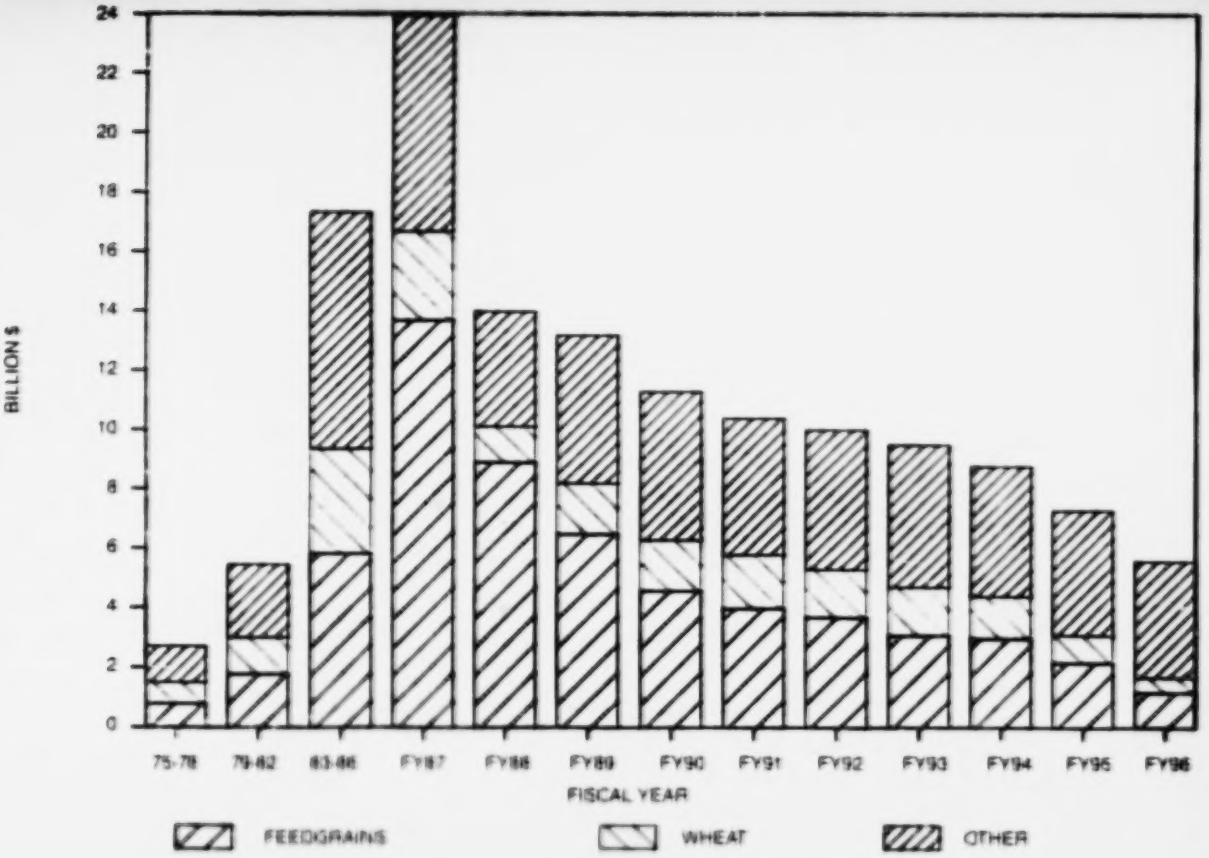

Figure 11. Government costs. (Source: CARD/FAPRI 10-year Projections, spring 1988.)

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PROSPECTS FOR FOOD AID NEEDS AND GLOBAL FOOD SUPPLIES

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Fifteen years ago, developing countries had a $15 billion agricultural trade surplus. That surplus has now disappeared. Self-sufficiency for most categories of basic commodities has declined, indicating a growing gap between consumption and production. The volume of food aid to these nations has risen sharply during the last decade. These trends raise some disturbing questions about the future.

- Will the reliance by developing countries on food imports and food aid continue to grow?
- If so, will food supplies and low prices be available to accommodate the need?

This paper presents a set of 10-year projections for production, consumption, and trade of agricultural products for the world and for developing countries. The underlying long-term trends in world agricultural production, consumption, and trade suggest abundant supplies during the coming decade. However, increases in production and consumption will not be evenly spread among all countries. A rising reliance on food imports and food aid is expected in a number of low-income countries.

The projections presented in this paper are based on assumptions about production technology and resource use, agricultural and trade policies, world commodity price levels, and international economic growth and credit availabilities. These assumptions appear to have a relatively high probability of occurrence compared to other scenarios. However, other developments, such as changes in international economic and financial integration or developing country growth in nonagricultural exports and foreign exchange, could also have an impact.

Agricultural production in developing countries has trended upward about 2.9% a year since 1950. The per capita rise was 0.8% a year (see figure 1). But demand increased even faster and the growth in agricultural imports exceeded exports. Self-sufficiency (production/consumption) for total cereals fell from more than 55% in the early 1960s to nearly 50% in the 1980s. Self-sufficiency also

declined for vegetable oils (from 128% to nearly 100%) and for cotton (from 160% to 125%).

Agricultural imports by the developing countries has climbed 3.2% a year since the mid-1970s. Food aid flowing to these countries has risen about 3.7% a year and has accounted for an increasing proportion of total agricultural imports.

GLOBAL DEMAND AND SUPPLY FACTORS

Most world agricultural commodity markets are characterized by large stocks and low prices. The projections presented here assume that these excess supplies will cause minor changes to be made in agricultural or trade policies in the major producing and exporting countries. These changes will help balance world markets during the next 5 years, but will fall short of a degree of trade liberalization that would help sustain a balance in world markets.

Demand

Forces that generate demand—like population and income growth—were weaker in 1981 to 1986, compared with 1970 to 1981 (see table 1). Population growth has generally slowed, except in low-and middle-income developing countries. Per capita income growth has fallen and even slipped to negative values. Only the centrally planned economies have seen growth. Export growth has similarly declined, except for low-income and centrally planned economies. And prices for agricultural products, increasing in 1970 to 1981, declined sharply in 1981 to 1986. These forces, their weakened states combined, imply declines or smaller increases in agricultural trade. Can we anticipate a strengthening in these forces?

The answer is yes for some forces, but no for others. World demand for agricultural products will likely grow more slowly during the coming decade than during the boom of the 1970s, but faster than in the past 5 years. Several conflicting forces shape this outlook.

- World population growth peaked during the 1960s at nearly 2% a year. Slower population growth, now about 1.6% a year, is expected to continue. But even that relatively slow rate will produce about 80 million more people to feed and clothe each year—a significant demand-building fact of life.
- Many countries will experience slower income growth than in the 1970s. But income is likely to grow faster than in the early 1980s, particularly in developing countries.

- Most commodities will be available on world markets at low prices, frequently with favorable credit terms.
- The debt problem will continue to constrain both income and import demand in debtor countries, but to a lesser degree over time as debt is retired, restructured, forgiven, or otherwise resolved.

Total and per capita demand growth will continue to be fastest in the developing countries, particularly in the newly industrialized countries. Growth of agricultural demand in developing countries has been projected at 3% per year, well above that of the middle-income countries (FAO, 1987). Demand growth will continue to be strong in the centrally planned economies, especially in China.

Demand for agricultural products is not only growing but also shifting to higher quality and more highly processed foods. More of the world's population will seek higher quality diets. We will see a continuing gradual shift toward higher valued and processed products, particularly in developing countries. Distribution and processing margins will account for a growing share of total food expenditures.

People with rising incomes will want more protein, generating a growing demand for feedstuffs. World use and trade of feed grains are expected to climb faster than for food grains. Developing countries use 35% of their wheat and coarse grain for feed and they will likely increase that percentage. Many middle-income developing countries will maintain imports of feed grains rather than meat in order to generate employment at home.

World demand for high-protein feedstuffs will rise even faster than for feed grains. Livestock feeding in the centrally planned economies is inefficient, principally because of the composition of feed rations. The average protein content is low, particularly in the USSR and Eastern Europe. The ratio of high protein feeds to feed grain there is about 6%, compared with more than 25% in Western Europe.

Supply

World agricultural production steadily increased between 1950 and 1986 at 2.4% a year (see figure 2). The per capita increase averaged 0.5% a year. Growth in production was not evenly distributed: some countries and regions became large surplus producers while others experienced rising deficits. Although the growth in production has fallen below the long-term growth rate during the last 7 years, it is unclear that this decline represents a slowing in production growth.

Technical change and increased use of purchased inputs have significantly affected production. Area for major crops increased substantially in the 1950s and 1960s, but most production increases over the last 15 years were due to increasing yields per acre (see figures 3 and 4). Government-supported research and extension programs helped boost productivity as did price support programs.

World grain and soybean yields have risen an average 2.3% and 1.8% a year during the last 25 years. We have seen most of the effect of the green revolution in rice and wheat, but other technologies and productivity-enhancing management practices continue to emerge. The growth in crop yields has recently shown minor signs of slowing down, perhaps responding to lower world producer prices rather than the lack of technical innovations. Increasing feed efficiency probably will continue to boost livestock productivity. There are a number of new technological developments for the livestock sector, although their dissemination and adoption probably will be slow because of environmental and health concerns and constraints imposed by investment or management requirements.

The growth in agricultural production probably will fall below the last decade's 2.4% rate.

- Some countries enjoyed high growth rates during the last 10 years which will be difficult to sustain. Examples are China, Malaysia, Saudi Arabia, and Côte d'Ivoire.
- Low world prices and slower demand growth probably will slow yield growth rates. Average yields for wheat and rice probably will climb at a slower pace than in the past 15 years, during which use of high-yielding varieties will rapidly expand in major producing areas. The growth in coarse grain yields may also slide below the 2.3% long-term trend.
- Low world market prices are likely to discourage countries with rapidly expanding production and self-sufficiency from becoming significant agricultural exporters. China and India are examples.
- Low world prices also will deter production expansion in other countries, particularly those with high costs of production.

Trade Prospects

Even with little multilateral movement toward trade liberalization, a confluence of factors is moving us towards the long-term rising trend in world agricultural trade—3.5% a year since 1960, faster in the 1970s, but slower in the 1980s (see figure 5). There has been a trend toward world integration of agricultural markets. In addition, world commodity and financial markets are becoming

more closely linked. During the early 1980s, a number of countries responded to balance of payments and debt problems by curtailing imports, income growth, and investment. The debt problems are slowly being resolved. Full resolution, though not likely within the next 5 to 10 years, will mean brighter trade prospects. The current agricultural surplus implies relatively low agricultural prices for some time. Thus, we can expect the following trends to occur:

- somewhat slower growth of supply than in the last decade
- somewhat faster consumption growth than during the 1980s
- a shift of the production/consumption balance so that the current large stocks of grains gradually drop
- growth in world trade moving back toward historical rates

The gains in world agricultural trade flowing from this scenario will be gradual. Prices, particularly for grains, are likely to remain relatively depressed. World trade in farm products may expand 3% to 4% per year, below the 4% to 5% of the 1970s, but well above the stagnation of the 1980s.

World demand for wheat should continue to show strong growth, particularly in the developing and centrally planned countries. China will account for the largest increment of world wheat demand as the per capita consumption gains of the last decade continue. Expanding feed use is a relatively new factor contributing to the growth prospects for wheat. With consumption growing, the several-year-old recovery of world wheat trade will continue. World trade has recovered three-fourths of the 22 million ton drop of 1985-86. Although gains will be slower, the upward trend is clear. World wheat trade will probably grow about 3 million tons over each of the next 5 years, only slightly slower than the pace of the 1970s and early 1980s.

Demand for livestock products will expand at a somewhat slower rate than in the 1970s as slower growth in incomes and population offset consumer preferences for improved diets. Beef will continue to dominate world trade in meat. But poultry meat trade should expand, with the major poultry meat importers of North Africa and the Middle East together with several Asian markets providing much of the gain. It is likely that poultry meat will account for virtually all of the per capita increase in the world's meat consumption.

Growing feed use will account for all of the gains in coarse grain use. Large gains in feed use are expected in Mexico, North Africa, the Middle East, and East Asia as poultry and livestock operations expand to supply the meat demand generated by growing population and income. Large gains are also expected in the centrally planned economies. World coarse grain trade has shown virtually no increase over the last 2 years after its precipitous decline in 1984-

85. But an anticipated increase in demand for coarse grain in importing countries will translate into growing world imports. In particular, developing countries where consumption is rising are likely to increase feed imports, as will China and newly industrialized countries in Asia. Total world trade in coarse grains is likely to increase by 2 million to 3 million tons a year, roughly half the rate of the 1970s. Large supplies of feed-quality wheat on world markets will add to the pressure on coarse grain prices. Competition among various feed grains will be intense.

Growing world demand will expand trade in oilseeds and products, although growth will be restrained by the European Community's continuing move toward self-sufficiency. The strongest growth in import demand is likely to come from the centrally planned economies whose increasing oilseed and protein meal imports will enable them to more efficiently use feed grains.

World cotton trade over the last 2 years differs from the grain pattern. Cotton trade has jumped to a record level, world stocks have dropped precipitously, and prices have strongly recovered. Cotton trade will expand only modestly over the next decade because trade levels are already high and consumption is growing slowly. Trade grew by only about 100,000 bales a year during the 1960s and 1970s. Growth is unlikely to greatly exceed those gains. Increasing barriers to textile trade will mean a smaller volume of world cotton trade and lower prices for the world's cotton exporters.

Excess Capacity Remains

While grain, oilseed, and cotton stocks are beginning to drop, world agriculture will continue to have excess capacity for the rest of this century, particularly in the developed exporter nations. Growth of agricultural production in the developed market economies would need to be cut to approximately 1% per year—half of the projected expansion in productive capacity—to balance output with domestic and export demand (FAO, 1987).

Prices

Fierce competition between exporters for world markets burdened with surpluses has caused a sharp drop in world prices in the 1980s. Average cereals prices during the last 3 years, measured in 1982 constant dollars, declined 35% to 40% and cotton prices are 45% lower. Wheat prices have trended downward at about 2% a year since 1960 (see figure 6). Other cereals and oilseeds have followed similar trends.

Price patterns have been erratic however. After a sharp but short spike in prices in the mid-1970s, prices of most commodities have continued to decline sharply in the 1980s. Just as the 1970s price peak was an anomaly, current low prices are below long-run market-clearing equilibriums. Prices are expected to rise during the next several years as some of the current surpluses are worked off. However, the major producing/exporting countries will have problems in idling excess production capacity and will continue to compete for foreign markets. Some countries will promote exports to earn badly needed foreign markets. Other countries will promote exports to earn badly needed foreign exchange. Thus, world prices are expected to remain low for an extended period unless major regional production problems emerge.

OUTLOOK FOR DEMAND, SUPPLY, AND TRADE IN DEVELOPING COUNTRIES

Developing countries are increasing their food production, but growth in population and per capita consumption are causing food use to rise faster. The growth in production and in food demand is unequally distributed among the developing countries. Some countries are gradually becoming more self-sufficient, but the food gap in other low-income countries is widening. Some parts of Africa and Latin America will probably become more dependent on food aid in the coming decade.

Demand

Growing demand would brighten prospects for global agricultural exports if sustainable economic growth generated the revenues to pay for increased food imports while meeting debt payments. However, despite the recovery from the world recession of 1981-82, the debt repayment problem continues to constrain developing countries' agricultural imports. Resolution of this problem is one major precondition for the return to a normal world trading environment.

Adjustment to the over accumulation of debt in the 1970s has had several major consequences. In developing countries, a decline in per capita income growth has been a direct result of policies to constrain imports at least partially by inhibiting aggregate demand. Imports have also declined as countries attempted to control balance-of-trade deficits. Falling prices for their exportable products have been an additional constraint on many countries' ability to buy imports with export revenues.

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Export revenues have not grown as expected, partly because of increased competition for export markets. The increasing competition, resulting from various attempts to generate revenues for debt repayment, has driven down commodity prices, further exacerbating the repayment problems.

Renewed growth in developing countries will require investment in new industries or in existing export industries. The world's creditor nations have withdrawn credit or been reluctant to extend more credit to the debtor nations. These actions have resulted in reductions in gross domestic capital in the debtor countries. The ability of the developing countries to generate renewed growth is predicated on their capacity to increase investment and exports. Therefore, if a substantial number of countries are simultaneously reducing their capital formation as well as their imports, increased export sales become extremely difficult. Such has been the case since 1982 (Shane and Stallings, 1987).

Supply

Agricultural production in all developing countries rose steadily during the last 35 years, averaging 2.9% a year, compared with 2.4% for the world. Per capita production rose nearly 0.8% a year. Although production has risen faster than population growth, consumption has risen even faster. As a result, self-sufficiency has tended to decline for a number of commodities, and imports have risen.

The cereals sector is the best, and most important, example of these trends. Between 1960 and 1987, the growth in production of total cereals averaged 2.7% a year in developing nations. The 1.9% growth rate of average yields contributed more to increasing production than did the average 0.8% annual expansion in planted area (see figure 3). The growth in area tapered off during the 1980s and average yields have not risen for the past 3 years. However, the long-term outlook is for cereals production to continue to rise, although at a slower rate.

Self-sufficiency in cereals in developing countries has declined from an average of more than 55% in the early 1960s to about 50% during the 1980s (see figure 7). Net cereal imports by these nations increased from less than 10 million tons a year during the early 1960s to more than 50 million tons last year. Net cereal imports climbed slightly more than 8% a year since 1960 (see figure 8). During the 1980s, net cereals imports have risen about 2.5 million tons a year. The rate of increase in cereal imports is expected to slow slightly.

Oilseeds present a similar story (see figure 4). Total oilseed production has increased rapidly since 1973, averaging 3.5% a year. Increasing average yields, 1.9% growth rate, contributed more than did area expansion, 1.6%. Oilseed area climbed significantly faster than cereals area. Average oilseeds yields, as with cereals, have not risen for 3 years.

Although developing country self-sufficiency in oilseeds has remained relatively constant, self-sufficiency for the by-products—vegetable oils and protein meals—has declined (see figure 9). The self-sufficiency ratio in vegetable oils declined from about 128% in the late 1960s to nearly 100% in 1980, but recovered to 108% to 112% in recent years. Vegetable oil net exports declined from the 1965 to 1975 average of 1.2 million metric tons to less than 1 million tons in the late 1970s and early 1980s (see figure 10). Vegetable oil exports have risen during the last 3 years as Malaysian palm oil production and exports increased. Vegetable oil exports are expected to continue rising in the 1990s.

Cotton has been a major export crop for some developing countries. Yield increases contributed to nearly all of the 2% growth rate in output, since planted area changed little. As with cereals and vegetable oils, both cotton self-sufficiency and net exports declined. Self-sufficiency fell from more than 160% in the early 1960s to around 120% in the last several years. Net exports fell more than 15% during the same period.

Natural Resource and Technology Concerns

Future agricultural production gains in the developing countries will depend on land use and the continued adoption of yield-enhancing technology. The expansion in area planted to major crops (cereals, oilseeds, and cotton) has fallen well below the 0.7% long-term growth trend during the last 6 years (see figure 11). Although productivity gains continued to boost production, the future for technological advances is uncertain.

Land is being used more intensively in the developing countries. Multiple cropping and increasing intensity of slash and burn agriculture are mining soil fertility and, in some cases, causing permanent loss of productive capacity, as well as siltation of downstream irrigation and flood control infrastructure. Deforestation and desertification are resulting from intense competition for food and fuel. It is unlikely that changes in land use will make significant additional contributions to production in the future unless producer prices increase significantly.

Gains in agricultural output will depend more on technological advances because of the constraints on increasing planted area.

However, the green revolution technology has already been widely distributed. Indeed, appropriate application rates for fertilizer and pesticides have been exceeded in some areas. And radical technological breakthroughs which can have the same impact on output as did the high yielding varieties do not appear to be immediately on the horizon. Management constraints and health concerns will limit the use of livestock growth hormone technologies in the developing countries during the next 10 years. Meat production will likely rise, even on a per capita basis, but only as a result of better management of traditional production and feeding practices.

Trade

In the 1960s, the developing countries' total net agricultural exports averaged $15 billion (in real 1974-1976 dollars). Since the early 1970s, the trade surplus has disappeared (see figure 12). The volume of agricultural imports by developing countries has risen at a 3.2% compound growth rate since 1967, while exports grew at only 2.1%. The gap widened rapidly in the late 1970s and early 1980s as rising per capita income and the availability of international credit boosted demand. Commercial agricultural imports by developing countries declined in 1985 and 1986 as the debt problem intensified and the growth in credit slowed.

Food aid shipments to developing countries increased at a 3.7% growth rate (1974-1987). The volume of all food aid products (13.3 million tons in 1987) has grown an average of 350,000 tons a year during the last decade (see figure 13).

An estimated additional 19.7 million tons of cereals are needed in 69 developing countries in 1987-88 to meet minimum nutritional standards. Increases in food aid to meet nutritional need are largest in South Asia (6 million tons) and in East Africa (5.7 million) (ERS, 1987).

Although cereals dominate total food aid (92% of volume during the last 3 years), contributions of dairy products and other noncereals have been growing much faster. During the last 10 years, the growth rate for cereals was 1%, compared with 9.7% for dairy products and 13.7% for other noncereal products (see figure 14).

Food aid as a percentage of total imports rose significantly the last several years. During the late 1970s and early 1980s, cereals imported as food aid accounted for 12% to 18% of total cereals imports. Since the mid-1980s, cereal food aid comprised more than 20% of total imports.

One of the reasons for increased food aid in recent years has been the limited foreign exchange that developing countries have had available for commercial imports. In 1984 and 1985, 69 develop-

ing countries spent about 10% of their collective foreign exchange availabilities (defined as foreign exchange reserves plus export earnings minus debt service obligations) on commercial food imports; 30 countries used more than 10%, 8 used more than 20%, and 2 more than 30%.

CONCLUSIONS

Many of the long-term trends, interrupted in the 1970s and 1980s, may reemerge during the coming decade.

World agricultural production will continue to rise during the next decade, but at a slower pace than in the past. Surpluses will continue to persist, but will gradually decline from their current high levels. Real agricultural prices will rise slowly from current depressed levels, but excess production capacity in major exporting countries will keep real prices low for an extended period. International agricultural trade will pick up again, but not reach the growth rates of the 1970s.

Demand growth in developing countries will rise from current depressed levels, but stray below the 1970s because of lower population and income-growth rates. A few middle-income developing countries will enjoy rising per capita consumption, as well as quality improvements in diet. For the bulk of the low-income countries, however, per capita consumption will stagnate. The growth in agricultural output will slow slightly as land resources increasingly become a constraint to expanded output. Productivity increases could slow somewhat during the next decade because green revolution technology is already widely distributed and no major new technology breakthroughs that are readily applicable are on the immediate horizon. Developing countries will continue to shift from being net agricultural exporters to net importers. The need for both commercial food imports and food aid will rise significantly if current nutrition levels are to be maintained in the low-income countries.

Table 1. Determinants of global agricultural demand

Item	World	Developing			Developed			Centrally planned economies
		Total	Low income	High income	Total	EC	U.S.	
				——percent——				
Share of world population, 1986	100	54.51	42.15	12.37	14.72	5.35	5.07	30.76
Annual population growth rates:								
1970-1981	1.84	2.41	2.45	2.31	0.77	0.34	1.05	1.48
1981-1986	1.65	2.39	2.45	2.19	.54	.10	.92	.93
				——1980 dollars——				
GDP* per capita								
1970	2,363	837	420	2,217	8,496	8,249	9,790	1,407
1975	2,576	974	468	2,658	9,453	9,186	10,534	1,577
1980	2,808	1,084	482	3,104	10,803	10,521	11,805	1,694
1986	2,931	1,073	484	3,082	12,027	11,356	13,056	1,869
				——percent——				
Annual growth rate in GDP per capita								
1970-1981	1.61	2.40	1.32	3.11	2.34	2.21	1.93	1.72
1981-1986	.80	- .23	- .06	- .15	1.87	1.60	1.56	1.94
				——1980 dollars——				
Exports per capita								
1970	376	236	112	646	1,293	1,818	674	101
1975	441	245	111	694	1,658	2,375	908	128
1980	526	270	93	863	2,166	3,056	1,197	141
1986	603	263	84	873	2,746	4,059	1,018	180
				——percent——				
Annual growth rate in exports per capita								
1970-1981	3.14	.92	-2.97	2.72	5.11	5.18	5.16	2.72
1981-1986	2.68	.14	.81	.10	4.20	5.09	-2.78	5.82
Change in agricultural import prices								
1970-1981	8.59	9.67	9.82	9.61	9.59	9.59	8.58	6.21
1981-1986	-3.46	-4.88	-5.42	-4.56	-2.84	-2.91	-1.64	-2.62

Source: See and Shane, updated.
*GDP = gross domestic product.

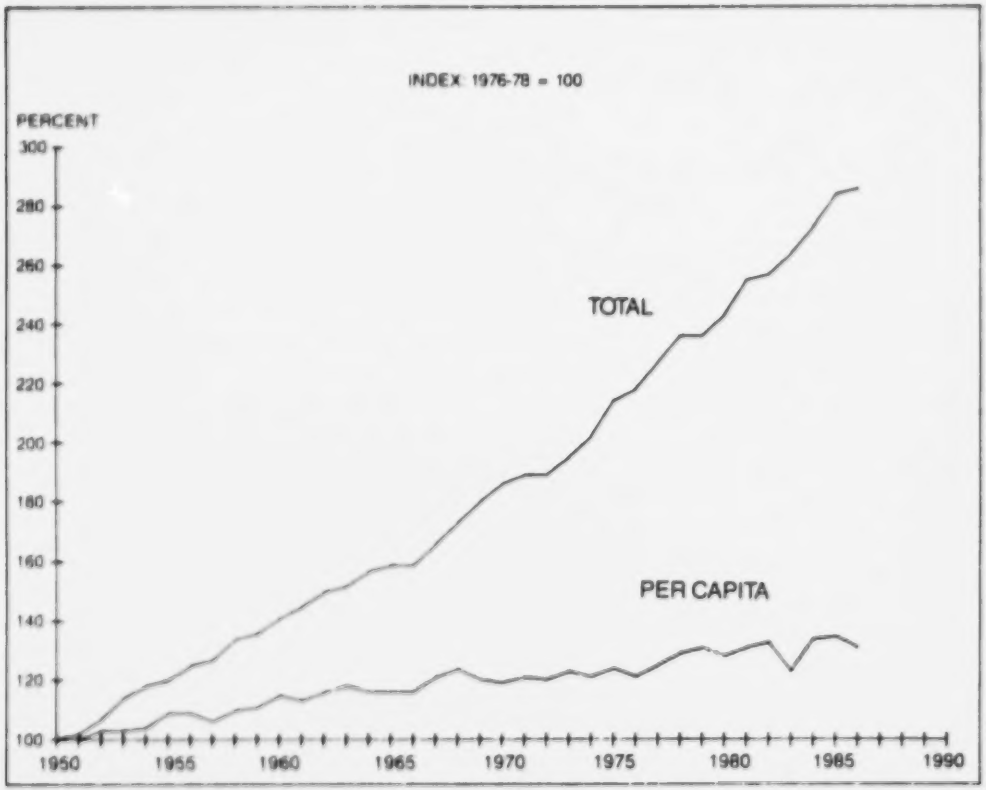

Figure 1. Agricultural production in developing countries.

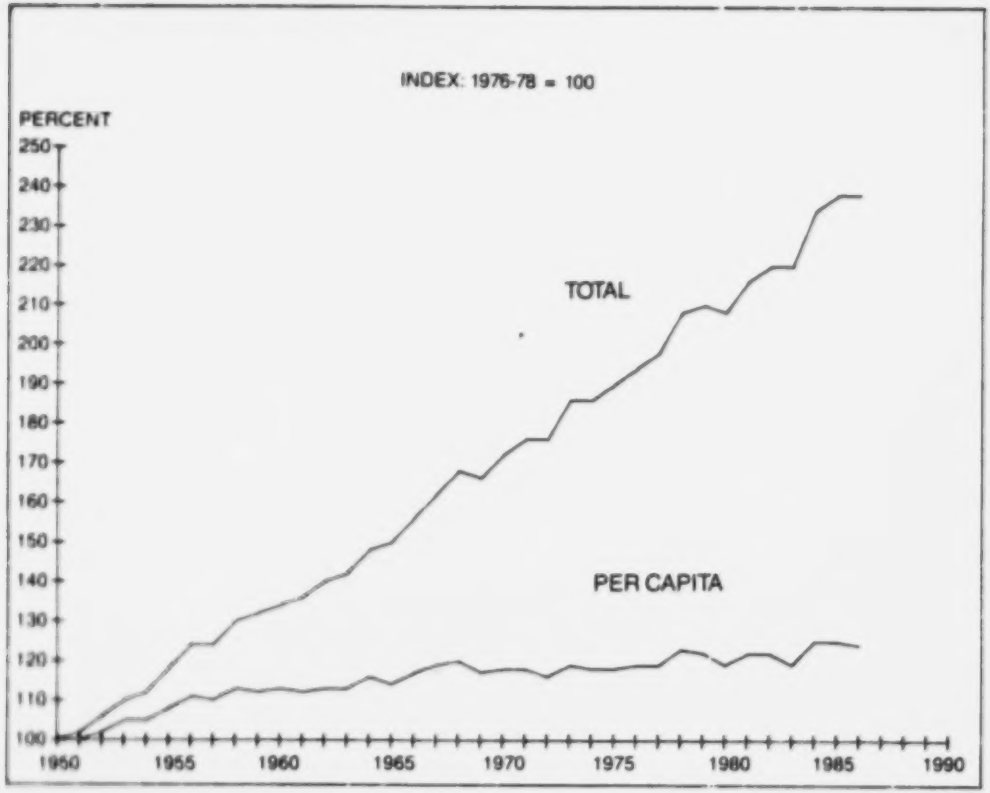

Figure 2. World agricultural production.

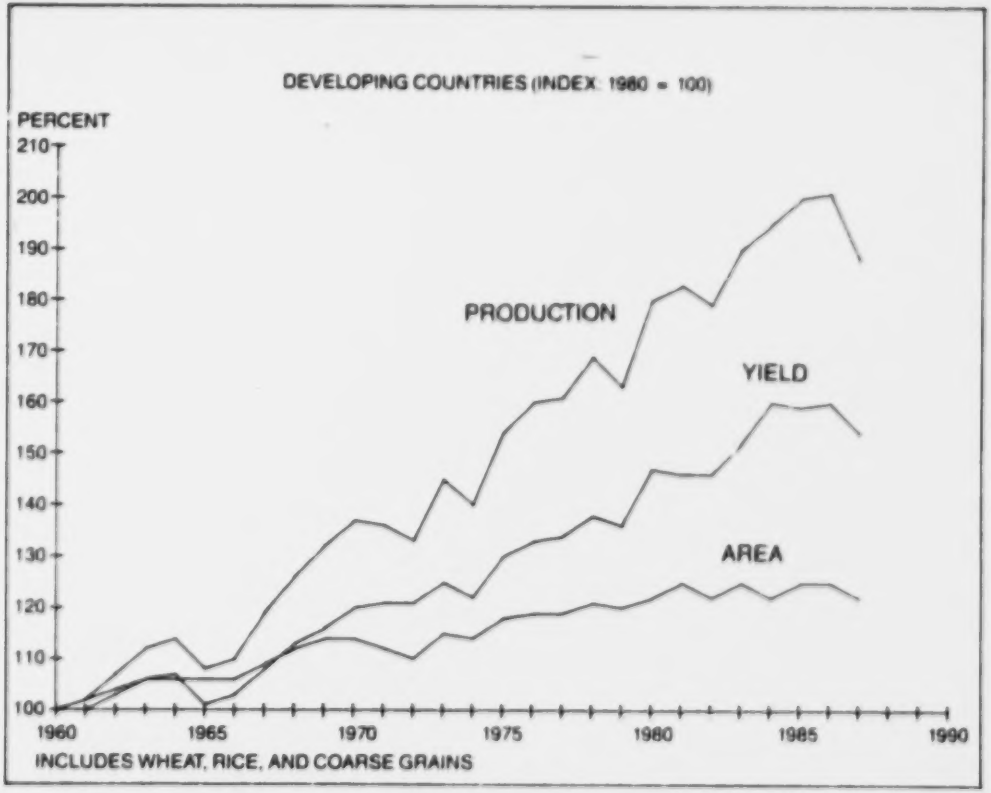

Figure 3. Total cereals: area, yield, production.

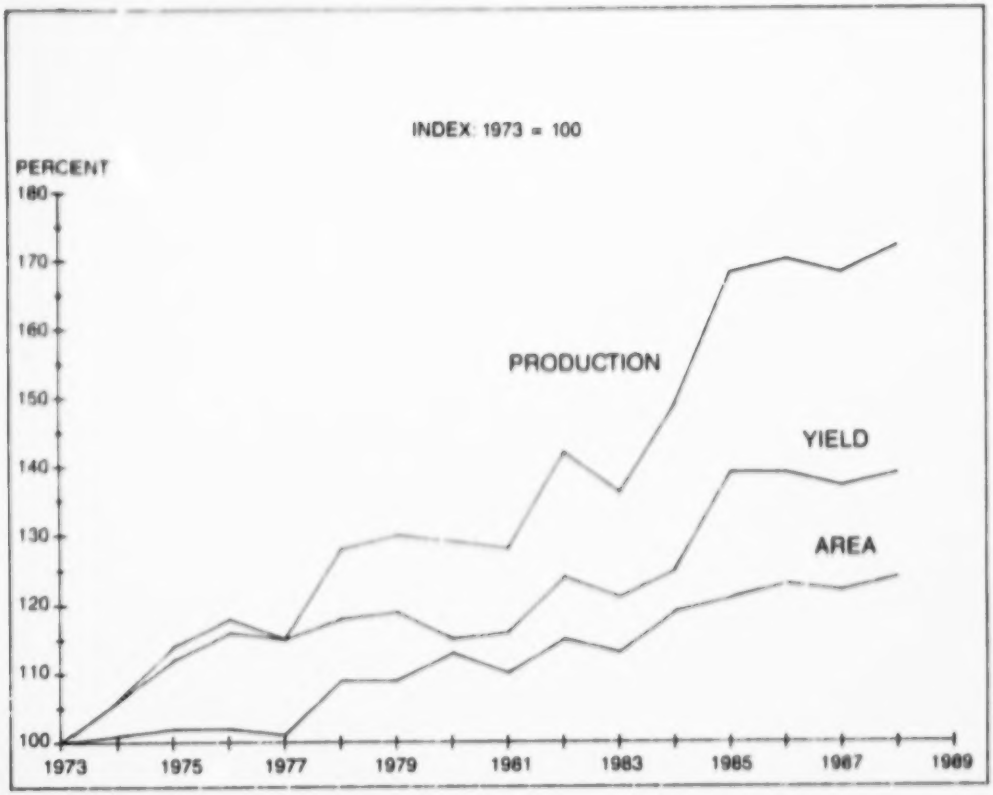

Figure 4. Oilseeds: area, yield, and production in developing countries.

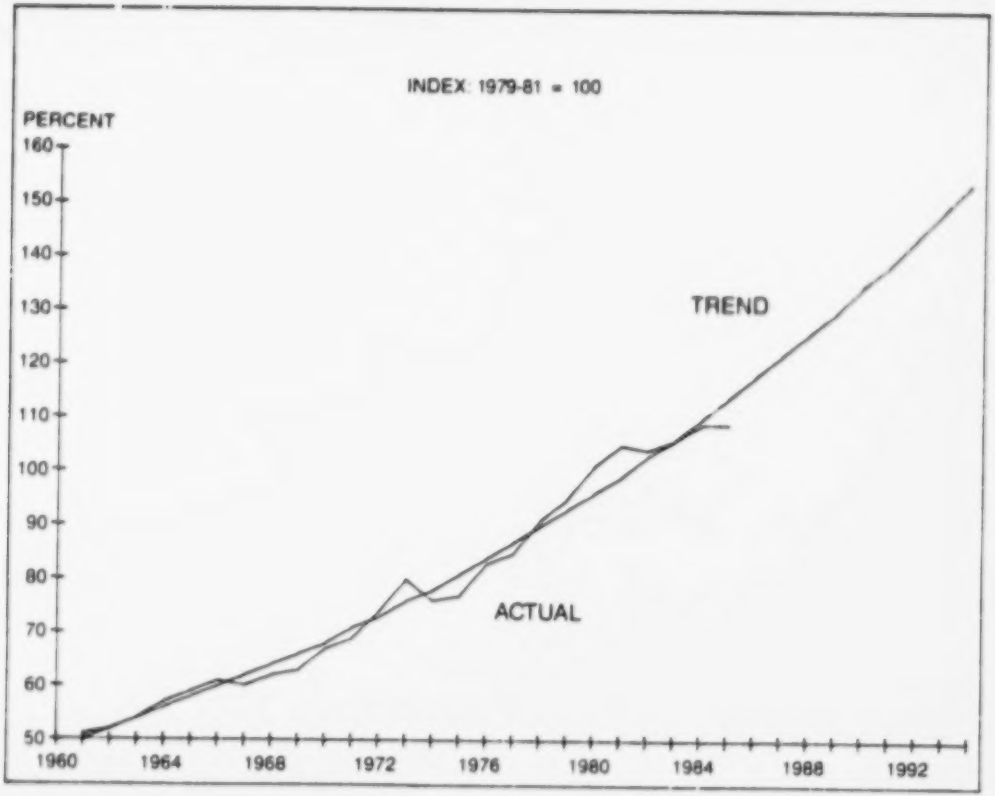

Figure 5. World agricultural export volume.

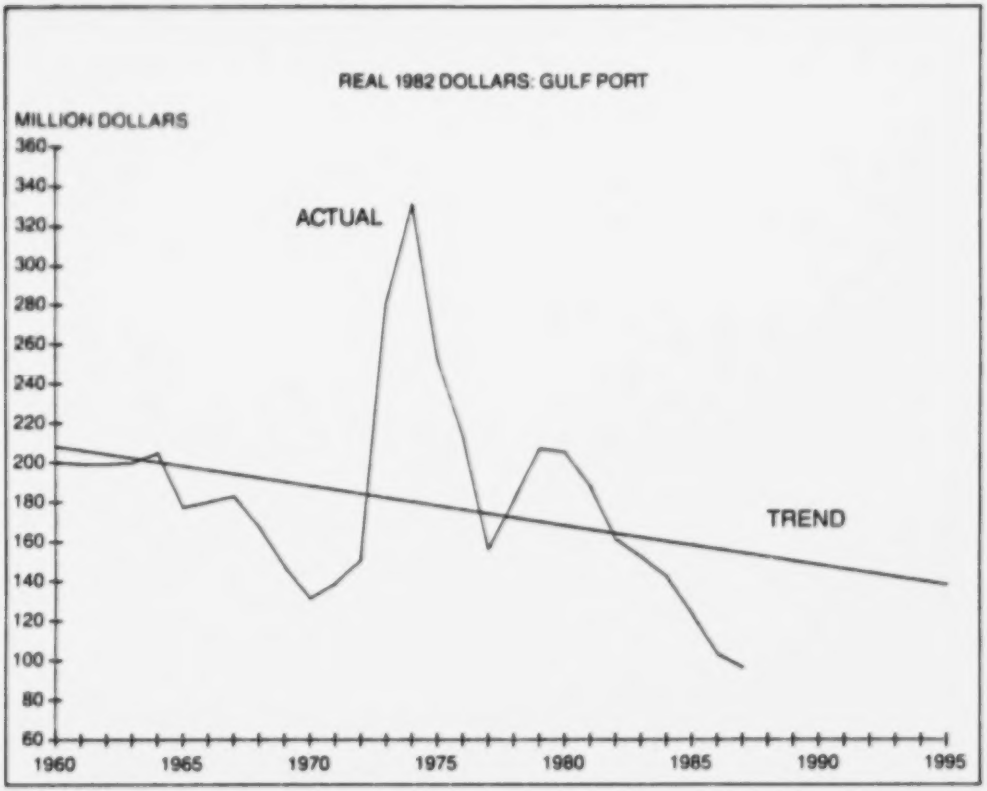

Figure 6. Wheat prices: hard red winter wheat.

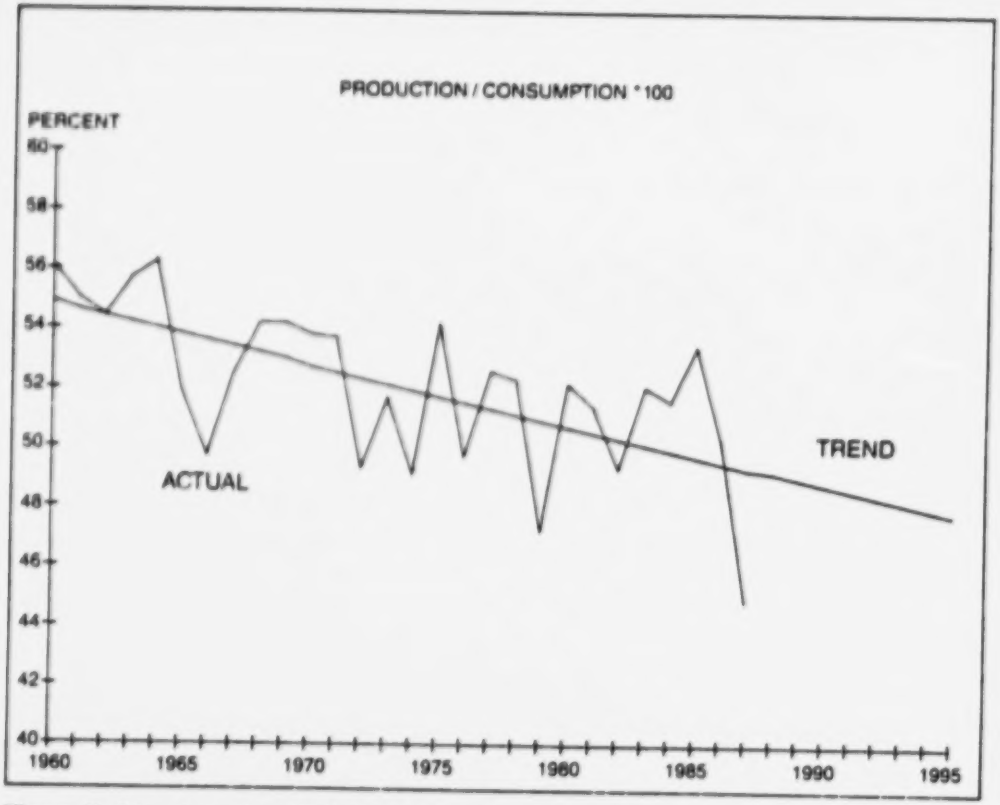

Figure 7. Cereals self-sufficiency in developing countries.

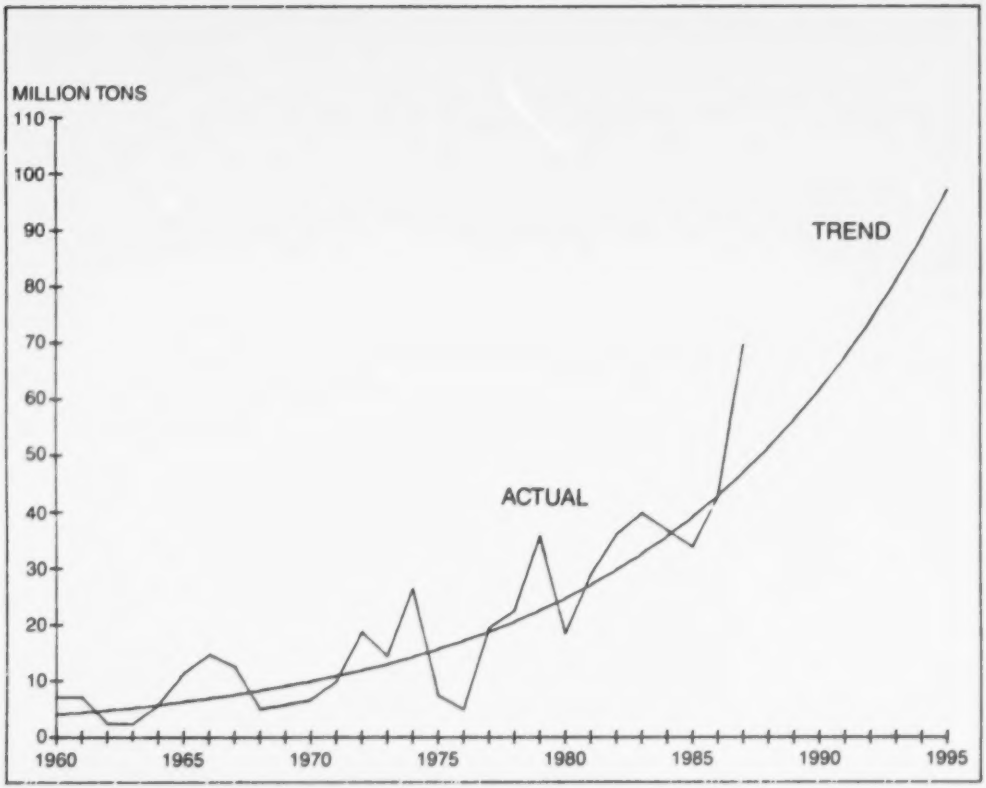

Figure 8. Net cereals imports in developing countries.

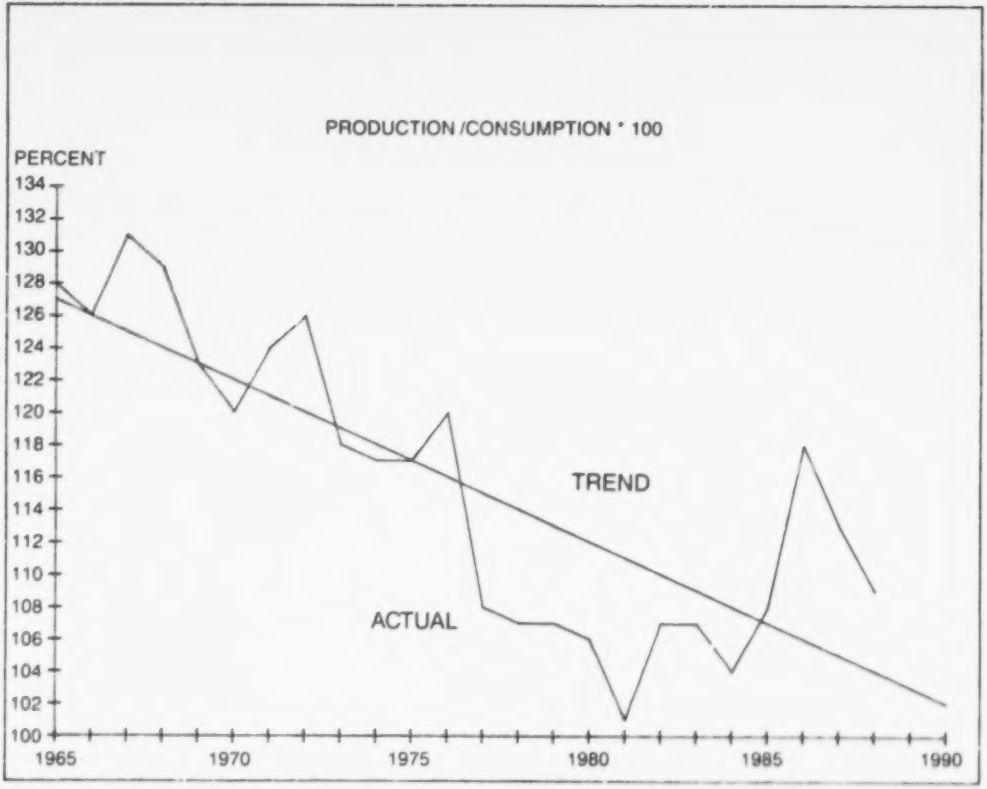

Figure 9. Vegetable oil self-sufficiency in developing countries.

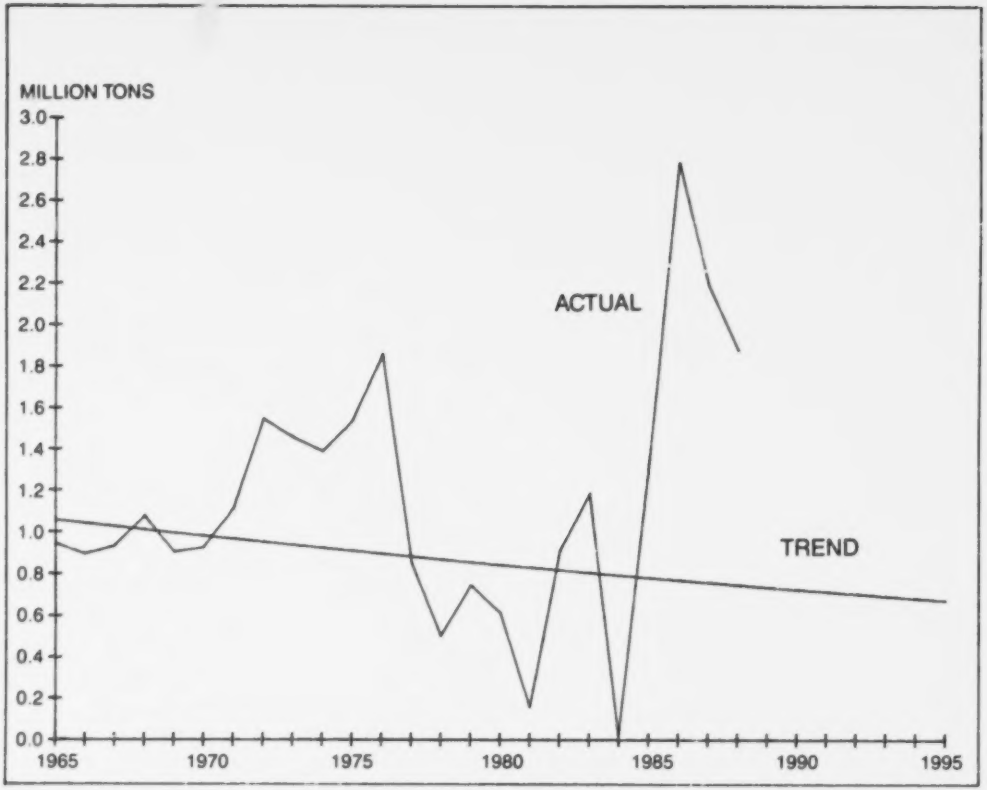

Figure 10. Vegetable oil net exports in developing countries.

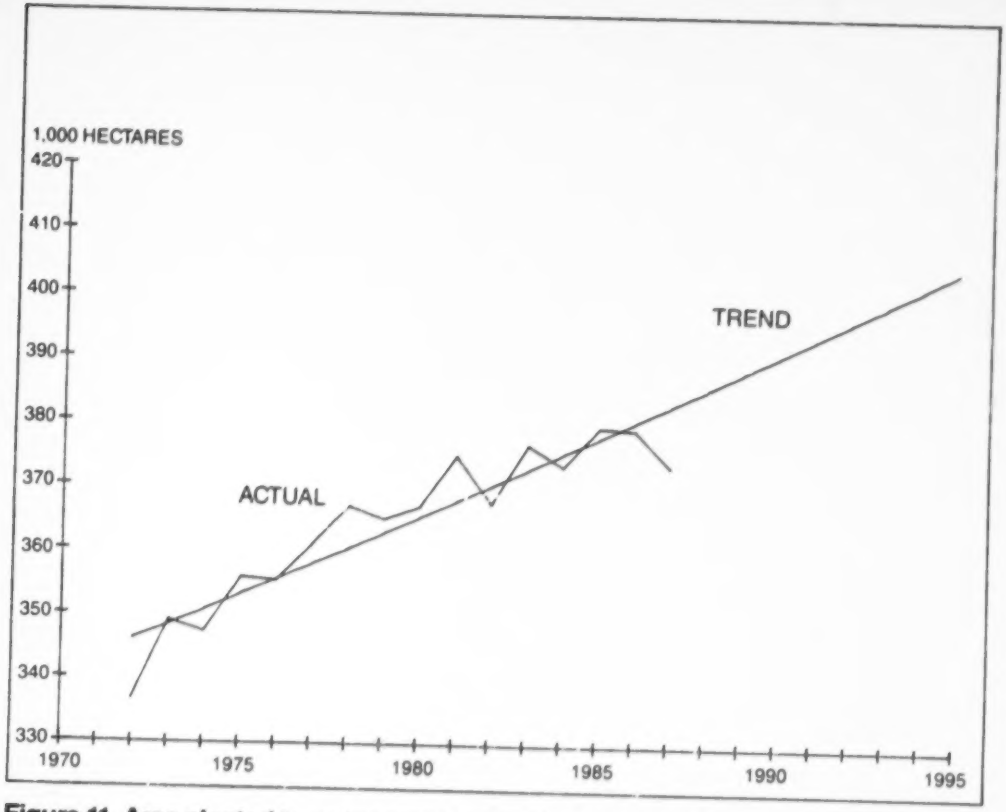

Figure 11. Area planted to major crops in developing countries.

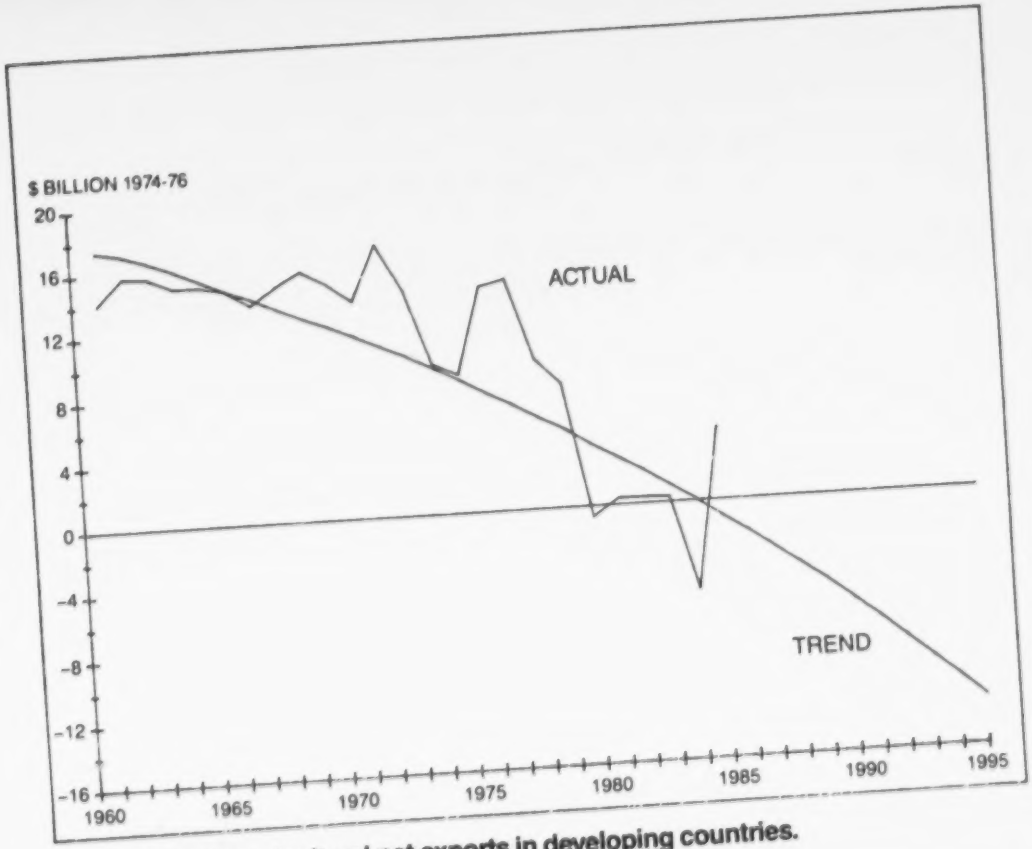

Figure 12. Real agricultural net exports in developing countries.

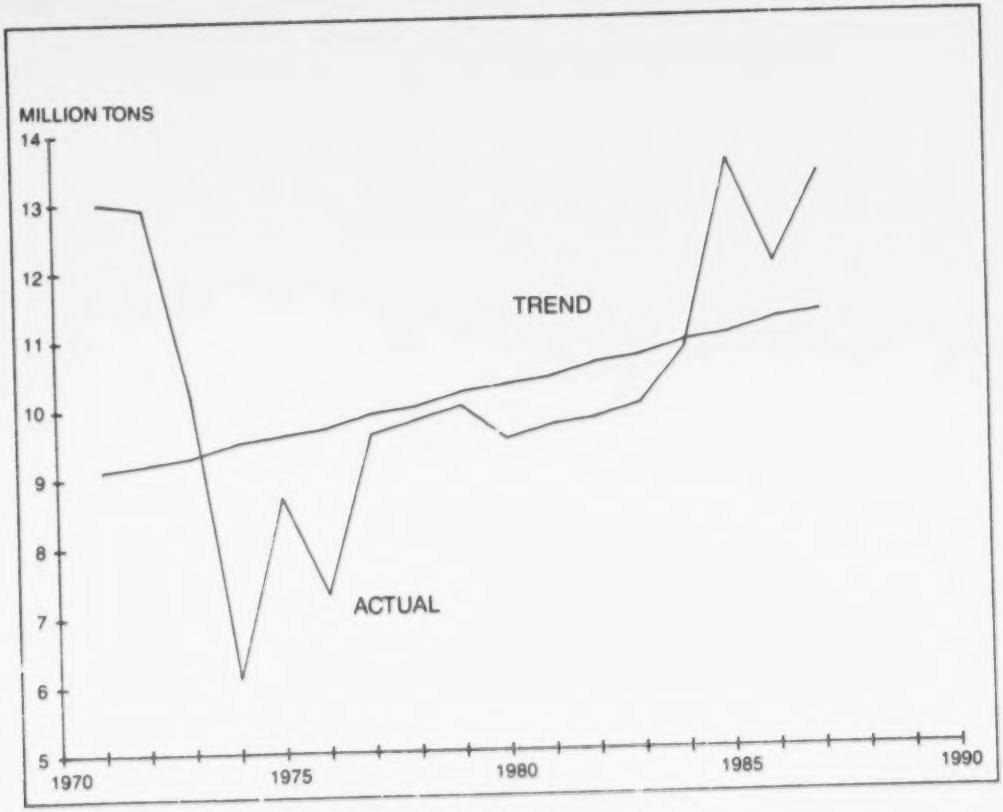

Figure 13. Volume of world food aid shipments.

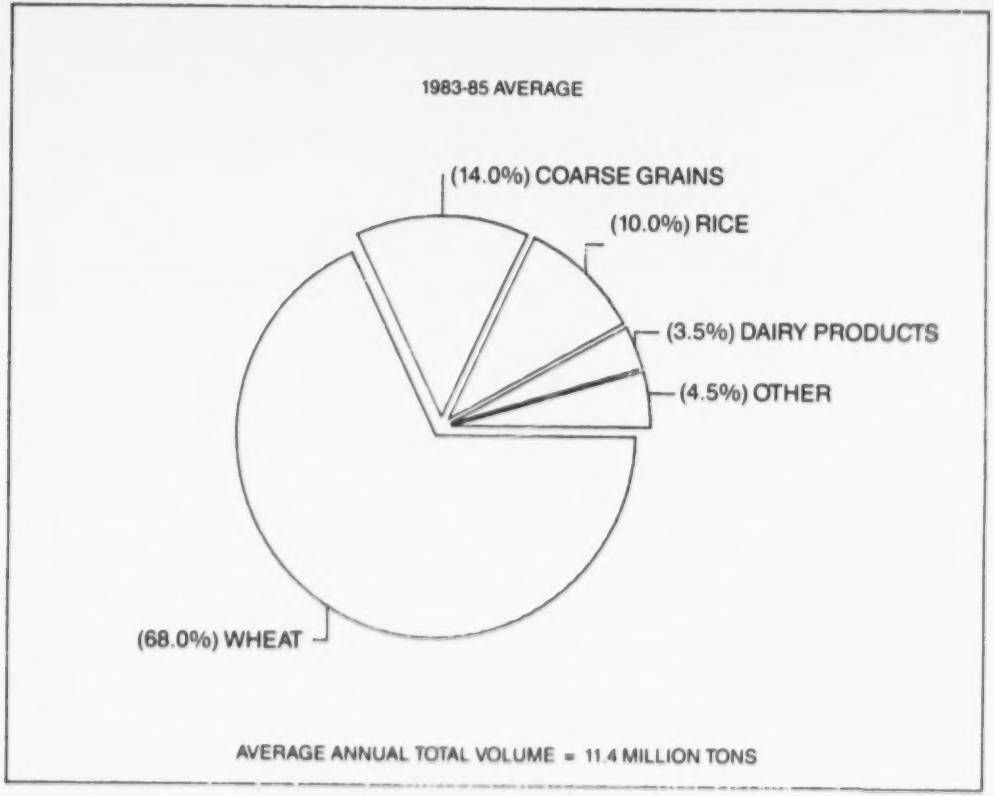

Figure 14. Composition of world food aid.

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PART 2

NUTRITION AND HUNGER ISSUES

REDEFINING NATIONAL SECURITY

Philip Johnston
Executive Director, CARE

Most Americans perceive a strong link between military capability and maintaining national security; in fact, many believe that one provides the other. We need to redefine how our national security is maintained because in the 1990s and beyond, the greatest threat to our security will not be military in nature, but economic. Our international development policies and programs for the 1990s will be designed to protect our national security.

The need for rethinking how our national security is maintained is based on the increasing importance of two crucial factors which should be included in the equation used in determining policy.

The first is the reality of a growing interdependence among nations. With each passing year our nation becomes more closely bound to other nations in all facets of international affairs. Consider, for example, the degree of coordination between the central banks of the most industrialized countries in seeking to stabilize the value of each other's currencies. Can any of us dispute the concept of global economic intertwining after the stockmarket crash of 1987? Economists and business people alike have acknowledged for some time the existence of a world economy.

For years, manufacturers of products ranging from clothing to cars have sought cheap labor outside the United States. The drop in shipping costs has also contributed to this trend. Harvard economics professor Robert Reich cites these—along with the technological advances in computerization and satellite communications—as the main factors contributing to our one global community.

Take, for example, the automobile industry—a clear example of global manufacturing. With American car manufacturers chanting "Buy American!" it has become increasingly more difficult to do. According to *Consumer Reports,* the Ford Festiva, for example, is really a Mazda made in Korea and a Mitsubishi Precis is a Japanese Hyundai, also made in Korea. The confusion, they tell us, doesn't end there. The Chevrolet Sprint is really a Suzuki and the Dodge and Plymouth Colts are made by Mitsubishi and all three are produced in Japan.

An important implication of interdependence among nations is that we are less free to choose policies which may be advantageous for us but detrimental for others. Conversely, what happens to the well-being of one group of people will more and more directly affect the well-being of another. Our policies for the 1990s must reflect that awareness to ensure our own quality of life.

It is heartening to note, therefore, that in some areas of trade—insurance, banking, telecommunication, and environment, for example—we appear to be striving for consensus, seeking the common good for humankind everywhere.

The second factor our decision-makers should consider when formulating policies for the 1990s is the expanding role that trade with developing countries will play in our economic well-being. Developing countries constitute our largest block of trading partners. At present, 40% of our exported goods and services are purchased by developing countries. Ten of our top 20 trading partners are from the developing world. When our decision-makers ponder where our economic growth potential lies, how can they ignore that almost three of every four people on earth lives in a developing country? Our economic well-being is influenced by exports to and imports from developing countries. In the 1990s our dependence on that marketplace will increase enormously. Our capacity to create new jobs is closely linked to expanding the consumer markets in developing countries.

Trade with the developing world is currently receiving a great deal of attention because of the inability of many countries to service their international debt. These problems, severe as they are, should not prevent us from recognizing that it is in our own best interest to help these economies grow because our growth is so closely linked to theirs. The reverse is also true; writing off the third world would adversely affect our current standard of living.

If, as Professor Reich asserts, current trends are allowed to continue, then our children and theirs will not have the kind of income, housing, or benefits we presently enjoy. So it is imperative that our national security, in all its ramifications, be reexamined. Reich's point is that our vision has to be changed to reflect a broader scope. Farmers must be urged toward crop conversion and workers toward "new economic products and processes instead of investing in asset rearranging and casino-like financing. We ought to be investing in future products and processes that can meet world standards, and be competitive."

Certainly there are current examples of this. One such forward-thinking company is the cooperative, Land O'Lakes. It has been positioning itself with third world countries in order to take advantage of opportunities as they arise in the global market place and is

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looking to expand its markets by diversification. Land O'Lakes has led all other commercial ventures in assisting third world farmers with technical assistance and sales of farm supplies. Land O'Lakes is building relationships which lead to commercial opportunities. It is their belief, and mine too, that it is naive to assume withholding such assistance will somehow keep these countries from learning the latest technological advances. As developing countries' economies emerge, Land O'Lakes will be prepared to meet the growing demand. In short, companies like Land O'Lakes need to be and are involved to ensure the development of stable emerging economies which offer good market opportunities for U.S. products.

We at CARE feel strongly that global economic interdependence and trade opportunities with developing countries should be considered in determining policies affecting our national security. But other challenges of great impact cannot be overlooked.

Consider the impact of population growth on the already unstable employment environment found in the developing world. As populations increase in the third world, the rate of job creation will become vastly more important than it is now. In fact, forecasters have projected that 800 million new jobs must be created by the year 2000 to meet the need for employment. What do you suppose will happen if those jobs are not forthcoming? I don't believe Americans understand the full import of this crisis.

To illustrate—did you know it is estimated that shortly after the year 2000, Mexico City will have in excess of 30 million people or that the average Kenyan today is approximately 14 years old? What will happen in the third world, for instance, when most unemployed youth drift toward urban centers? Unless the situation changes drastically in the urban centers of most developing countries, they will find no jobs, high inflation, and social unrest. These conditions will spawn huge numbers of economic refugees who will migrate away from the cities that offer no hope to cities that do. The urban centers most likely to become the recipients of these refugees are located in developed countries. How many people any given city can successfully absorb is anyone's guess.

This impending crisis was the focus of a recent New York Times article aptly named, "Old World Fearful of Third World's Silent Invasion." In it, an adviser of French President Francois Mitterrand refers to what may become the developed world's greatest motivation for helping developing countries stabilize their economies: the massive onslaught of immigrants.

To use and paraphrase his quote, "We [too] are threatened by [the] peaceful invasion." Traditionally, "The United States has prided itself in being a nation of immigrants. Yet, in some Americans the specter of an invasion across the Rio Grande touches the

same fears the Western Europeans have when contemplating runaway population growth..."

The United States as well as other developed countries cannot ignore what is already a trend. Failure to do so will not only limit our own growth but tax our system's ability to provide for its citizens and increase the ever-growing pressure on our social services—the very problem European countries are already facing.

Meanwhile, in the developing countries, failing to address this issue would increase the likelihood of destabilization which would perpetuate the trend toward migration. The outcome of such a trend would be disastrous for everyone; no one would win.

I believe America's national security in the 1990s and well into the twenty-first century will be enhanced in direct proportion to the efforts we make toward strengthening the economies of our global neighbors.

CARE believes the U.S. should set two specific goals as a high priority in our interaction with each developing country. As a nation we should make the following resolutions:

- to play a leadership role in mobilizing the world community to provide every child with adequate nutrition, adequate health care, and a primary education
- to play a leadership role in mobilizing the world community to protect the environment of each developing country, particularly their topsoil, forests, and water supplies

The United States cannot be the only player in any world movement but we should provide a strong voice in the global forum. We must join with others who recognize the validity of the concept of "spaceship Earth." We cannot survive economically or politically alone. Our survival or our national security is inextricably linked to the ability of others to prosper. It is foolhardy and unwise not to invest heavily in the future of our world.

NUTRITION, HEALTH, AND AGRICULTURAL DEVELOPMENT

Peter L. Pellett
Professor of Nutrition, University of Massachusetts

It is now commonly accepted that malnutrition is caused by many interlinked economic, political, and social factors affecting food supply and health. Gone is the formerly mainstream opinion that limited the factors to nutrients in food and their use in the body. Now, if you asked what determines nutritional status, the answer must be "almost everything."

Maletnlema (1980) says the widespread prevalence of malnutrition is a symptom of a very sick society. Because of its multifaceted causes, solutions must also be multifaceted, even if elimination of poverty and improvement of living standards are basic. Malnutrition affects the growth, development, and survival of children, and the health, activity, and well-being of adults. Conventional solutions in the form of specific programs are usually inadequate since they do not reach causes. Nutrition can be improved through upgrading the level of living—particularly of real income, food availability, and health services. Therefore, long-term solutions are outside the traditional nutrition field and will occur through economic and social development.

While the term malnutrition strictly should include overnutrition and some of the diseases of affluence, it is often used to mean only the condition resulting from a deficient intake of energy or of a particular nutrient. Four especially important and broad factors cause malnutrition: an insufficient supply of the foods necessary for a balanced diet, often due to poor agricultural production; an uneven distribution of the available food (both between and within families); a lack of knowledge about food, nutrition, and health; and infectious diseases which are synergistic to malnutrition (Latham, 1979). It must be recognized that these are not separate and distinct causes, but groups of causes which overlap with each other.

Recently the obvious basic links between nutrition and agricultural policy have become more formalized (FAO, 1982; Tripp, 1982; Lunven and Sabry, 1981; Miladi et al., 1983; Pinstrup-Andersen et al., 1984; Frankenberger, 1985; Nygaard and Pellett, 1988). Farming systems research is now widely applied to integrate agricul-

tural development activities (soil and irrigation improvements, new varieties, and techniques) at the level of the small farmers. If nutrition information can be collected and analyzed within this framework, then decisions can be made about incorporating nutritional objectives into development aims (Mokbel and Pellett, 1987).

Health as a component of integrated development is not new. The phrase "marriage of health and agriculture" dates from at least the 1930s. More recently Article I of the Declaration of Alma-Ata (WHO, 1978) reaffirms that health is "a state of complete physical, mental, and social well being and not merely the absence of disease and infirmity...a fundamental human right...whose realization requires the action of many other social and economic sectors in addition to the health sector." In Article VII (WHO, 1978), the promotion of food supply and proper nutrition and development of the agriculture and food industries are identified as necessary for improved health. Primary health care (Mahler, 1975) is now seen as part of a multisectoral effort in agriculture education and community development. It therefore seems essential that agriculture should also integrate health into its development activities, with extension workers cooperating closely with community health workers involved in primary health care.

The involvement of political issues in health and nutrition concerns is also not new (De Castro, 1952) but was ignored for many decades. If nutritional status is determined by the fluctuations of international trade or the prime interest rate, is it relevant to measure nutritional intake in dietary surveys or to compare the growth of children to reference standards? The answer must still be "yes" but both immediate and basic causes of malnutrition must be examined (Johnson, 1981). Nutrition is one component only in the overall aim of improving health in the process of development.

MAJOR PROBLEMS OF MALNUTRITION

Hunger is no doubt widespread: conditions that could be described as hunger range from the gross manifestation of prolonged starvation to mild and apparently reversible growth failure (see table 1). Estimates of prevalence thus can differ widely (Poleman, 1981ab). Estimates in a recent study by the Food and Agriculture Organization of the UN (FAO) vary between 335 and 494 million undernourished people depending on the criteria used (FAO, 1985).

The conditions of protein energy malnutrition and the factors causing low birth weight in babies overlap to a considerable degree with hunger, so much so that they may be indistinguishable. The majority of infants with low birth weight (< 2500 g) in developing countries are those of normal gestational age. The frequency of birth of such infants can be several times greater than in developed countries (UNICEF, 1988). Such children are more prone to infections and also lag in their subsequent development. Maternal dietary supplements can increase birth weight (Lechtig et al., 1979). But in an environment where health care is often lacking, maternal mortality is high. Furthermore, the desire by mothers for small babies (and easier birth) should be recognized, since it can negate programs for nutrition intervention until health care facilities are improved.

The world prevalence of protein-energy malnutrition has been estimated from data of some large-scale surveys (Bengoa, 1973; Bengoa and Donoso, 1974; Puffer and Serrano, 1973). Using the proportions estimated by Bengoa and Donoso (1974) and later population estimates, it is probable that 100 million cases of protein-energy malnutrition currently exist in developing regions. This number is a minimum, since many children are reported to have died from infectious diseases where malnutrition was a likely underlying, or major, simultaneous cause.

Another nutritional problem of considerable significance is hypovitaminosis A, considered to be the most common cause of blindness in developing areas of the world (WHO, 1976; Underwood, 1978). Estimates from studies in rural Indonesia (Sommer et al., 1982) indicate an incidence of 2.7 per thousand for corneal xerophthalmia among preschool children. Half of these children probably develop bilateral blindness. Extrapolation of this rate to the preschool children of Bangladesh, India, Indonesia, and the Philippines would indicate a frequency of 500,000 cases per year for corneal xerophthalmia with up to 10 times as many with less severe deficiency.

Hypovitaminosis A, as a public health problem, will only be eliminated when the society has access to a diet sufficient in vitamin A and other nutrients that affect vitamin A metabolism. Serious hypovitaminosis A occurs most frequently in countries where protein-energy malnutrition of children and generalized poverty are also major problems (Underwood, 1978).

CAUSES OF HUNGER AND MALNUTRITION

Many factors cause malnutrition in individuals or communities in money- based societies (see table 2). The path to malnutrition starts with overall food availability. Food availability is affected by international and national politico-economic activities as well as agricultural policies within and external to the country. Next is family purchasing power. This also is dependent on political and economic factors, but at a more local level. Food purchases are determined by food availability as well as economic status and money availability. Next comes food choice. Within any economic group, the pattern of food purchases is dependent on cultural pattern and individual preferences as well as relative prices of the various foods. Nutrition education can work at this level by increasing selection of nutrient-rich foods over nutrition-poor sources that cost the same. However, nutrition education is far less effective than we would wish (Schurch, 1983).

Next is the pattern of food distribution within the family. This pattern is also dependent on culture and is frequently a major cause of malnutrition in the vulnerable groups. Women and children need more protein and nutrients, despite lower energy needs, but this is often a complicated notion to impart since it frequently conflicts with cultural norms.

Finally, because of the now well-known interrelationships between malnutrition and infection, (Scrimshaw et al., 1968; Chen, 1983) consumed food may not be fully used. This last cause of malnutrition can then be termed food utilization. An individual suffering from infection or infestation may not only have a reduced food intake, but may also poorly use a range of nutrients. Sanitary environment and clean water availability thus profoundly affect nutritional status and reinforce the view that health considerations must be integrated with agricultural development.

Protein requirements have tended to vary considerably over the years. This seriously affected the credibility of nutritionists among the agricultural community. The perception grew that protein deficiency was the fundamental cause of most world malnutrition. Plant breeders developed high protein and high lysine varieties of grains, but by the time they were available, protein and amino acids requirements had been reduced and the role of the new varieties was no longer of high priority. Additional reasons for the failures of these projects, however, included insufficient attention to the acceptability of the new grain varieties for making traditional foods such as tortilla and arepa.

Estimates of the incidence of undernutrition and malnutrition draw attention to the magnitude of the problem and to changes that have occurred (see table 3). To determine appropriate policies and measures for nutritional improvement. We must identify the malnourished and why they are malnourished (FAO, 1985). Food deprivation often results from inadequate control over food resources and other factors that govern overall health. The ability to copy is further diminished. As food deprivation becomes more intense, it is the poor who ultimately revert to the most irreversible responses, such as selling productive assets. Thus food deprivation not only exposes the poor to greater risk but frequently leaves them more vulnerable (Brooke-Thomas, Paine, and Brenton, 1988). The poorest people, such as the unemployed and landless, therefore suffer worst because they lack resources for obtaining an adequate diet. Within the poorest groups, young children and pregnant and lactating women are the most vulnerable because of their higher nutritional requirements. Preschool children are the most seriously affected, and their risk of malnutrition is often increased by other factors such as large family size, high birth order, illiteracy of parents, single parentage, maternal age, short stature of the mother, low per capital land availability, and poor access to social services (Morley, 1973; FAO, 1985).

The Fifth World Food Survey (FAO, 1985) thus emphasized that food and nonfood factors combine to form a "web of biological, socioeconomic, cultural, and environmental deprivations leading to malnutrition." As wealth increases, more food is consumed and the types of food selected changes. In a classic report, Perissé, Sizaret, and François in 1969 used Food Balance Sheet data to demonstrate that the proportion of dietary energy intake from fats fell steeply as income (gross national product) declined while that from total carbohydrates increased. Simultaneously the proportion of the total protein intake from animal sources decreased with a fall in income.

In table 4, health, wealth, and dietary data from 130 countries shows that as wealth (indicated by gross national product) increases, the infant mortality rate, the under-five mortality rate, and the prevalence of low birth weight infants decline. At the same time percentages of births attended by health personnel and access to a clean water supply increase. Availability of dietary energy (Kcal) increases in total protein per day, animal protein per day, the percentage of animal protein in relation to total protein, and total fat and retinol (vitamin A).

Table 5 shows a cross-country correlation matrix between selected health, economic, and dietary data from the same 130 countries. As per capita GNP increases, child and infant mortality

rates decline, the percentage of low birth weight infants declines, and life expectancy increases. Improved economic status brings significant increases in availability of total dietary energy, protein, animal protein, and fat. Protein, animal protein, and fat consumption also relate significantly to infant and child mortality rates. These dietary factors are also related to life expectancy since the largest component weighting life expectancy values is infant mortality.

THE NEED FOR INTEGRATED HEALTH AND AGRICULTURAL POLICIES

Accelerating growth in per capita food supplies in the developing market economies has reduced the proportion of the population suffering from undernutrition. Nevertheless, as a result of population growth, the absolute numbers of undernourished have increased. It is now widely recognized that policies cannot be limited to one sector at a time.

As stated by FAO (1985), "Policies to attack malnutrition should be multidimensional. Accelerated agricultural and economic development and more equitable income distribution will provide the only long-term solution. But much more needs to be done for those who for a long time will be bypassed by general growth and development. Appropriate nutrition intervention programs, targeted as closely as possible on the most deprived rural households, should be mounted on a large scale. Because of the complex interactions between malnutrition and infectious diseases, programs for providing primary health care, sanitation, and safe drinking water should go hand in hand with nutrition intervention programs. Because of the many roles that women play in the food system of developing countries—not only as mothers but also as farmers, laborers, traders, and teachers—the status of women should be raised and their education improved. This move would have a telling influence on nutrition improvement.

Malnutrition has traditionally been viewed as a problem related to food availability and, therefore, solvable by increased production. But, over the last decade emphasis has been shifting to improving distribution to help those most deprived. In most countries, more than half of those in need are families of landless agricultural laborers, farmers with land holdings too small to be reached by rural development programs, small-scale fishermen, and unemployed urban workers (Berg, 1987). In addition malnutri-

tion continues to be widespread in many countries that are now considered to be self-sufficient in food grains, such as India, and also those which have shown considerable economic development such as Brazil. Although it is acknowledged that malnutrition is closely linked to basic economic development, Berg (1987) strongly advocates that improvements in nutrition cannot wait for high economic growth. Improvements can come from careful targeting of food subsidies, from food supplementation programs, and from nutrition education to those groups most at risk, especially poor women and children. This position closely echoes the advice proposed by FAO (1985).

Nutrition is now a well-known aspect of development projects. Such nutrition components have been implemented by United Nations agencies (FAO and WHO) as well as some of the International Agricultural Research Centers and the Agency for International Development (USAID). The problems with these components as found in World Bank projects (Berg, 1987) parallel those found by other agencies. My own experience fully supports these conclusions: when projects are add-ons they are generally small in size and therefore receive little attention both from national governments and from the implementing agency staff. Berg (1987) considers quite correctly that this problem also reflects the fact that nutrition as a discipline cuts across sectors and "can slip through the organizational cracks."

One recent AID-funded activity in Sierra Leone—the Adaptive Crop Research and Extension (ACRE) project—included an "add-on" nutrition component and was broadly successful both in involving women and in alleviating some hardships of the hungry season by the introduction of improved varieties of sweet potatoes. With hindsight some provision of medical services by the female nutrition extension workers could have improved their rapport with mothers and women farmers. Apparently no health services were provided in the region by the Ministry of Health. While ACRE and the Ministry of Agriculture could give health advice and use oral rehydration, they were unable to provide medical treatment, medicines, and drugs. A good case could be made in such circumstances for integration between agricultural extension and primary health care in any successor activity to the ACRE project. However, no successor project was funded and the relative success of ACRE appears to have been celebrated by USAID by its complete withdrawal from Sierra Leone.

Decision-making for nutrition programs is now being undertaken in an environment that has changed markedly over the last decade. Conservative politics in several major donor countries combined with a much more difficult international economic envi-

ronment have reduced the ability to address basic human needs. Possibly as a consequence, an analysis of data from 30 countries shows that during the first half of the 1980s all but three experienced declines in per capita dietary energy supply accompanied by an increased infant mortality (Berg, 1987). A somewhat earlier analysis (FAO, 1985) was much more optimistic and showed dietary energy declines between 1970 and 1980 in the 112 countries and territories examined. It is possible to be optimistic about worldwide progress when recent UNICEF (1988) health data are examined. In the 33 countries with the highest rates worldwide, under-five-year mortality rates have declined from median values of 308 per 1000 live births in 1960 to 211 in 1986. For the 31 countries in the next highest group, median values declined even more significantly over the same period from 251 and 135 per thousand. Parallel improvements were also reported in adult literacy and primary school enrollment rates.

CONCLUSIONS

The number of people estimated as malnourished in the world is now based on far more stringent criteria than in the past. While the validity of all estimates can be criticized it is now believed that they are not as much in error as the earlier surveys. "In a significant way however the conclusions of each have been identical to those of the first survey...There is much starvation and malnutrition in the world (FAO, 1985)." In addition the diets that are consumed by the disadvantaged are heavily based on cereals and thus monotonous and generally poorer in nutritional quality (Perissé et al., 1969; Pellett and Young, 1988a). The distribution of diets within countries is also likely to show a skew distribution (Scrimshaw and Lockwood, 1980; Mellor and Gavian, 1987) with the lowest strata receiving diets significantly poorer in both quality and quantity than the perhaps already marginal country mean values.

However, it now seems evident that while there has been worldwide improvement in per capita food availability (FAO, 1985), in reducing child mortality, and improving opportunities for women (UNICEF, 1988), many, not only in the very poorest countries, have been by-passed by the fruits of development. To reach these, political commitment is needed at the highest level—as well as some new ideas. Nutrition projects have not always been fully successful, food subsidies have been abused and have had adverse effects, and economic adjustment issues have often removed nutrition activities from the agenda. Nevertheless there is now increasing recognition that in economic development, "trickle-down"

does not always reach the lowest layers. Conversely, however, economic crises and subsequent austerity programs can have severe adverse effects on the very poor.

Some targeted nutrition programs such as the Tamil Nadu Integrated Nutrition Project can claim considerable success (Berg, 1987). According to the monitoring data for the 9000 villages in the program, 17% to 24% of the children weighed less than 70% median weight/age (Indian standards) at the beginning of the project. By early 1987 only between 7% and 10% were below that level. This represents a decline of about 58%. Berg (1987) claims, from these and other data from the project, that a well-managed and targeted program is able to reduce serious and severe malnutrition more than a less-focused program and at a significantly lower cost.

The need for greater integration of agriculture and health policies now appears to be widely accepted. The background document on Intersectoral Action for Health (WHO, 1986) goes further and contains much important information relevant to implementation. In addition a recent statement following a workshop on the impact of agricultural and food supply policies on nutrition and health status (Wallerstein, 1986) concluded that, "The international nutrition community, both life scientists and social scientists, needs to devote more adequate attention to developing or identifying real linkages with agricultural and food policies that can have a positive impact on the circumstances of poor people." The statement acknowledged that the decision-making arena for nutrition and health issues is very different from that for agriculture and food policy. Officials from the two areas approach problems, or policy-making, from very different viewpoints. Recommendation for linkages has not always taken this into account.

More recently, almost a complete issue of the FAO publication Food and Nutrition (FAO, 1987) was devoted to consideration of health, agriculture, and rural development. Here again political commitment was emphasized and a series of detailed recommendations were tabulated to enhance interaction among the health, nutrition, agriculture, and rural development sectors. Since the author (Atienza-Salvana, 1987) is the director of the National Nutrition Council, Ministry of Agriculture and Food in the Philippines, at least one developing country appears to explicitly support these interactions at a high political level.

My own experience from viewing a number of agriculture and health projects in the Middle East and Africa is that, so far, close cooperation across the whole spectrum of health, agriculture, and rural development is very rare mainly because of the vertical structure derived from separate Ministries. At the village level, how-

ever, activities undertaken by community health workers and nutrition-agricultural extension agents can overlap considerably and could become the focus for shared community development activities. It is important that such workers be local people selected for training and supported by their communities. (One person should not be responsible for both health and agricultural roles except perhaps in nomadic populations where agricultural extension may center on animal health and the same person could also be responsible for primary health care. In Somalia there is already some cooperation between the separate ministries of health and livestock.) In many countries shared cold-chain facilities for both human and veterinary use could be very cost-effective and the beginning of other cooperative activities.

No attempt should be made to assign rigid priorities; whichever activity arrives first in a community (health or agriculture), successive activities should then begin to develop based on cooperation. In such a way concepts of horizontal, community-based, cooperative activities may become functional without the traditional ministerial barriers. The mechanisms outlined by Atienza-Salvana (1987) are reasonable and could well be applied to other areas of the world since they are based on political experience and are sufficiently broad. From my own experience the following suggestions may also be relevant to both implementation and evaluation of projects concerned with improvement of health of the disadvantaged:

- In cooperation with economists, attempts should be made to quantify the true social costs of malnutrition. In the competition for scarce resources, those with the power to allocate priorities should be informed of the future costs to society of continued poor health and malnutrition, especially in children.
- Qualified health-nutrition personnel could be in a position to prepare nutrition impact statements so that ministers, especially for planning and finance, could be informed of the potential effects on the health and nutrition of the population of the various fiscal and planning actions that they might take.
- Commitment, support, and continuity are essential at the highest political level. Lip service is not enough. Those in power must truly believe that health of the very poor is important enough for policies directed to its improvement. They must further believe that this will not happen automatically by the magic of the marketplace within a sufficiently short time-span to be relevant for those in need.
- Leadership and commitment are also essential at the local level. Programs of equal merit will thrive or fail dependent on local leadership.

- No single grand agriculture-nutrition-health plan can ever exist. All plans must be tailored to local needs and local priorities, again emphasizing the essential nature of local leadership and community involvement.
- The bottom line of any development project is the removal of impairments to the growth of children. Improvements in production and other economic indicators, while important, are often irrelevant to the most disadvantaged. Growth of children will only change significantly when both nutrition and health are simultaneously satisfactory.

Finally, to move from the local and national levels to the international arena, the problems of food aid and the well-being of children in the developing world were examined in a recent UNICEF-WFP workshop (UNICEF-WFP, 1986). The inconsistency between food aid and the long-run objectives of self-reliance in food and nutrition was recognized. "This basic inconsistency is at the heart of the well-known problems associated with food aid—problems of lack of incentives to local agriculture, of taste changes away from local products, and of weak (often negligible) positive effects on nutritional levels, because a target group is rarely covered consistently over a sufficient period of time to raise nutritional levels." It was generally agreed that, providing the problem was recognized, a balance could be achieved between food aid for short-term needs and support for long-run self-reliance.

For long-term development even more fundamental issues of international cooperation (or its lack) must be considered. While the right to food and health care is often contained in documents prepared by world congresses established by U.N. agencies (e.g., United Nations, 1975); WHO, 1978), in practice *human rights abuses* generally mean the behavior of our political adversaries of which we wish to publicly disapprove. I do not believe that a true commitment to the alleviation of hunger and malnutrition on a worldwide basis will be apparent until our political leaders start using the term, and are committed to the concept that, human rights should include the right to an income or circumstances that allow access to adequate food and provision of health care.

Towards that end in 1977 an Independent Commission on International Development Issues (Brandt Commission) was launched. Commissioners were from the highest rank of public life in both developed and developing nations and were invited to serve in a private capacity, not under governmental instructions. Terms of reference were

> ...to study the grave global issues arising from the economic and social disparities of the world community and to

> suggest ways of promoting adequate solutions to the problems involved in development and in attacking absolute poverty. As an independent commission it is free to raise any aspects of the world situation which the commission considers pertinent and to recommend any measures it finds in the interest of the world economy.
>
> The commission should pay careful attention to the UN resolutions on development problems and other issues explored in international fora in recent years. It should seek to identify desirable and realistic directions for international development policy in the next decade, giving attention to what in their mutual interest both the developed and the developing countries should do.

The report (Brandt, 1980) was published in 1980 but hardly created a ripple on the world scene. However, many of its conclusions are as true now as they were then and as difficult to implement. A quotation indicates its scope.

> Mankind has never before had such ample technical and financial resources for coping with hunger and poverty. The immense task can be tackled once the necessary collective will is mobilized. What is necessary can be done, and must be done, in order to provide the conditions by which the poor can be saved from starvation as well as destructive confrontation.
>
> Solidarity among men must go beyond national boundaries; we cannot allow it to be reduced to a meaningless phrase. International solidarity must stem both from strong mutual interests in cooperation and from compassion for the hungry.
>
> The elimination of hunger is the most basic of human needs. Therefore we attach great importance to the increase of international food production and to the promotion of agriculture in many parts of the world which have become precariously dependent on imports.
>
> The quality of life is almost meaningless without health, which depends on proper nutrition and a healthy environment. This also demands more research and operational funds devoted to combating the diseases of people in poor countries. Health care, social development, and economic progress must advance interdependently if we are to attain our objectives for the year 2000.

I do not believe that the publication of the report would be met with such resounding disinterest today since the climate of opinion and

the recognition of our worldwide interdependence appears to have changed for the better over the last decade. I am impressed by the report's collective wisdom and would recommend those concerned with policies for food aid in the 1990s reexamine it. It was published ahead of its time.

A final quotation I believe correctly describes what should be our aims for the future. These aims "must be to diminish the distance between rich and poor nations, to do away with discrimination, to approach equality of opportunities step by step. This is not only a matter of striving for justice, which in itself would be important, but it is also sound self-interest not only for the poor and very poor nations, but for the better off as well" (Brandt, 1980).

Table 1. Characteristics of hunger and major nutritional disorders.

		Protein-energy Malnutrition					
	Hunger	Nutritional Marasmus	Kwashiorkor	Xeropthalmia	Goitre	Iron deficiency anemia	Low birth weight
Causation/precipitation long-term	Poverty, poor agriculture		Low-protein diet	Low intakes of carotene or retinol	Low intakes of iodine	Low intake of absorption of iron	Poor dietary intake since conception, infections of mother
Causation/precipitation immediate	Poverty, crop failure, war	Early weanings, infections	Infections	Early weaning, infections		Blood loss from infections	Low weight gain in pregnancy
Vulnerable group and main age of incidence	All ages	Children less than one year	Children between 1-2 years	Preschool children	Older children, women	Children 3 years, women of child-bearing age	Mothers of poor socio-economic status
Major features	Growth failure, wasting, lethargy	Wasting	Oedema, fatty liver, reduced serum albumin	Night blindness, xerosis of conjunctiva and cornea, keratomalacia, low serum retinol	Enlarged thyroid	Low hemoglobin (mitrocytic hypochromic anemia, if severe)	Hypoglycemia, hypothermia, poor resistance infection (low immunoglobin Ig G)
Consequences	Reduced growth, reduced work capacity	High mortality, impaired mental development	High mortality, impaired mental development	High mortality (especially when associated with protein-energy malnutrition), blindness	Cretinism	Pallor, reduced work and learning efficiency	High mortality, suboptimal development, high incidence of infection

Notes: There is considerable degree of overlap in infants between protein-energy malnutrition and low body weight. Protein-energy malnutrition (e.g., body mass as a function of age or height) in the early stages or of mid-moderate severity is usually subclinical and can only be diagnosed by anthropometric criteria. Low birth weight is defined as below 2400 g. In developing countries, the majority of low birth weights are due to fetal growth retardation.

Table 2. Schematic overview of some major factors affecting nutritional status.

Sequence	Some causes and (or) solutions
Food availability	International and national politics and economics, agricultural policy, production and distribution.
↓	
Family purchasing power	Political and economic factors at a local level.
	Targeted economic assistance.
	→Improved purchasing power.
↓	
Family food purchasing pattern	Poor nutrition knowledge.
	Nutrition education.
	→Improved food selection.
↓	
Within family food distribution	Poor nutrition knowledge.
	Nutrition education, targeted food assistance.
	→Improved food distribution.
↓	
Utilization of foods by consumer	Infection, infestation, poor sanitation.
	Health advice and services.
	→Improved food utilization.
↓	
Individual nutritional status	

Source: Pellett (1983); sequence adapted from Pinstrup-Andersen (1982).

Table 3. Estimates of numbers identified as nutritionally deficient in major world food surveys.

Year	Population size assessed (millions)	Nutritionally deficient (millions)	Proportion affected (%)	Basis for estimate	Reference
1946	2000	1000	50	Availability	FAO (1946)
1952	1900	1100	60	Requirement	FAO (1952)
1961	2800	1900	68	Ratio	USDA (1961)
1963	2500	1000[a]	40	Ratio	FAO (1963)
1964	2900	1900	66	Ratio	USDA (1964)
1976	1500[b]	1100	73	Ratio	Reutlinger and Selowsky (1976)
1977	2900	400	14	BMR[c] x 1.2	FAO (1977)
1985	2200[d]	335	15	BMR[c] x 1.2	FAO (1985)
1985	2200[d]	494	23	BMR[c] x 1.4	FAO (1985)

Sources: Adapted from Poleman (1981a and b); data for 1985 from the Fifth World Food Survey.

[a]Estimated on the basis of protein deficiency; number would fall to 400 million (16%) for food energy deficiency.

[b]Major developing countries only.

[c]Basal metabolic rate.

[d]Developing market economies.

Table 4. Health, wealth, and dietary data for 130 countries.

Group	No. of countries	Population (millions)	GNP[a] US$	IMR[b]	Under five MR[c]	Life expectancy (years)	Children under 5 yrs (%)	LBW[d] (%)	Births attended by health personnel (%)	Drinking water access	Kcal/ Kcal required	Total protein per day (g)	Animal protein (g)	AP/ TP[e]	Fat per day	Retinol per day (micrograms)
1	32	462	295	137	227	46	18	16	22	31	91	53	11	21	36	140
2	32	1498	1623	87	130	56	17	13	50	52	101	62	15	25	51	190
3	30	1692	2207	43	50	66	14	11	82	68	111	70	27	37	63	260
4	36	1165	7817	13	15	74	8	6	99	95	129	94	54	57	126	620
All	130	4817	2509	67	102	61	14	10	64	62	109	71	28	36	71	313

Source: Nutrient informaiton mainly FAO 1984 and 1986, supplemented from FAO 1980; all other data UNICEF 1987.
[a]Gross national produce per caput US$.
[b]Infant mortality rate: annual number of deaths under 1 year of age per 1000 live births.
[c]Under-five mortality rate: annual number of deaths under 5 years of age per 1000 live births.
[d]Low birth weight: percentage of births with birth weigh less than 2.5 kg. eAnimal protein as a percentage of total protein.
[e]Animal protein as a percentage of total protein.

Table 5. Cross country correlation matrix between health and dietary data (130 countries).

	No. of countries	GNP US[a]	IMR[b]	Total Protein (g/day)	Animal Protein (g/day)	AP/TP[e]	Fat (g/day)
Child mortality rate[c]	121-129	-.59	.99	-.68	-.73	-.72	-.67
Life expectancy (years)	121-130	.63	-.97	.72	.76	.75	.72
Low birth weight[d]	113-120	-.49	.55	-.64	-.61	-.58	-.61
Children under 5 years as total	121-130	-.59	.78	-.67	-.74	-.69	-.74
GNP US	120-121		-.61	.68	.78	.73	.78
IMR	121-129			-.70	-.75	-.75	-.70
Protein g/day	120-129				.88	.74	.85
Animal protein g/day	120-129					.95	.91
AP/TP %	120-129						.83

Source: Protein, animal protein, and fat mainly FAO 1984, 1986; but supplemented by FAO 1980. All other data UNICEF 1987.
Note: All correlation coefficients $P < 0.001$.
[a]Gross national product per caput U.S.
[b]Infant mortality rate: deaths < 1 year per 1000 live births.
[c]Animal protein as percentage of total protein.
[d]Number of deaths less than 5 years per 1000 live births.
[e]Birth weight less than 2.5 kg.

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PART 3

DEVELOPMENT ASSISTANCE AND U.S. AGRICULTURE: IMPACTS AND POLICY ISSUES

REEVALUATING SUBSTANCE AND PROCESS PRIORITIES IN DEVELOPMENT ASSISTANCE

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The demanding topic I've been asked to address imposes a high degree of humility. This humility has two primary sources. First, nothing I'm going to say hasn't been said before. And second, those who have had much more hands-on experience will probably challenge my contentions.

Allow me to focus on reevaluating substance and process in agricultural development assistance. For the sake of this discussion, let us define *substance* as the changes and improvements we perceive to be needed to enhance agricultural development, and *process* as the methods and procedures we use to bring about these changes and improvements.

Before giving my own particular view about the progress, or lack thereof, in both substance and process, I should emphasize that in general the United States has not done so badly in either area. Comparing America's efforts to those of other donor countries and international institutions, our success-to-failure ratio is not bad. In fact, in some areas we have demonstrated a distinct comparative advantage.

AREAS OF GREATER PROGRESS IN SUBSTANCE AND PROCESS

Let me first bring to your attention some examples of substance and process where significant progress has been made and where the United States has played a major role. As a point of clarification, when I speak of the United States, I am referring not only to the U.S. Agency for International Development (USAID) and its predecessor organizations, but to the U.S. foundations, universities, private voluntary organizations, private sector enterprises, and other American institutions that have been major contributors to worldwide development assistance.

Agricultural Technologies

Alleviation of hunger is certainly a main area in which we have made some progress. Despite rapid growth in world population, particularly in developing countries, the percentage of hungry people worldwide has actually declined. This has been accomplished through the creation and transfer of improved agricultural technologies that work—a process called the *green revolution*.

Please note that creation of better technologies was required, not just the transfer. Many in the development community believe that all the required technologies already are available and merely need to be transferred. My own first experience with that view took place in the Philippines in the 1950s. As a young professor at Cornell, I was sent to work on a U.S. aid-supported Cornell University project and was told: "You are not to do any research. Help them to reestablish their agricultural teaching capabilities, but don't get involved in research, it takes too long and we're a temporary agency." This view was based at least in part on the premise that the needed agricultural technologies already existed, and that if we spent 4 to 5 years helping the Filippinos rebuild their university, we could then go home and let them continue by themselves.

Well, I took advantage of the fact that each senior student had to do a thesis project. I took those students into the farmers' fields in groups and we carried out simple fertilizer trials on rice crops with nitrogen, phosphorous, and potassium fertilizers that were donated to the Filipino government by the United States.

If we learned anything in those 2 years, it was that the only benefits from the fertilizer applied to rice went to the company that sold it to the U.S. government. The technology that was appropriate in Japan and California—using fertilizer on rice—simply didn't work on the tall slender tropical rices grown in the Philippines. The plants tend to fall over (lodge) before harvest. If you add fertilizer, they just grow taller and fall over sooner. In this instance, as in so many others, technology transfer just wasn't the answer.

The green revolution, one of development's real success stories, began almost 30 years ago. The improved grain seeds that were needed—primarily wheats and rices—were developed. Water for irrigation, and chemical fertilizers and pesticides, also were made available to help farmers bring the new crops closer to their yield potential. Leaders of developing countries ensured increased, sustainable production of food through policies that did three things: they made it economically feasible for farmers to use the new technologies and inputs, they supported the building and maintenance of vital support institutions, and they supported the education and training of a critical cadre of expert scientists and technicians.

The high yielding, fast-growing, semi-dwarf varieties of wheat and rice developed, respectively, at the International Maize and Wheat Improvement Center (CIMMYT) in Mexico and at the International Rice Research Institute (IRRI) in the Philippines, were first introduced in developing countries in the mid-1960s. National agricultural research institutions quickly used these new cereal cultivars on farmers' fields and in their own research programs. The result was a true revolution in food production.

Indonesia's national scientists, for example, have worked with researchers at IRRI since the 1960s to develop new rice varieties that are both high yielding and resistant to a major plant pest, the brown planthopper. Over the years, most of the successful crosses were made by national researchers in Indonesia. The area planted to high yielding varieties of rice has increased from less than 500,000 ha in 1968-69 (about 6% of the area planted to rice) to over 6.6 million ha in 1983-84 (almost 82% of the area) (Dalrymple, 1986).

Filippino researchers have had a special advantage in their proximity to IRRI. Rice hectarage in the Philippines planted to new higher yielding rice varieties increased from less than 3% (83,000 ha) in 1966-67 to more than 85% (over 2,700,000 ha) in 1982-83, with an emphasis on varieties developed at IRRI (Dalrymple, 1986).

Since the 1960s, Pakistan has carried out an intensive wheat improvement program involving Mexican dwarf-variety seeds from CIMMYT, training for researchers, and intensive testing and promotion of improved varieties. From a total of 3.9 million tons of wheat of traditional varieties in 1966, production rose to almost 11 million tons in 1980, with 75% of the wheat area planted to the new varieties.

Today, about half of the wheat and rice hectarage in Asia and parts of Latin America is planted with the improved varieties developed at national and international research institutions. In the United States, semi-dwarf varieties were grown on nearly 60% of the area planted to wheat in 1984 (Brady). As new varieties emerge and the physical and economic conditions for their growth improve, the proportional use of high-yielding cereal varieties is sure to increase in both developing and industrial countries.

CIMMYT, IRRI, and the other international agricultural research centers have become a comprehensive mainstay of international agricultural research. Through USAID's Collaborative Research Support Programs (CRSPs), many of the U.S. land grant institutions, with their unequaled abilities in agricultural education, research, and extension, have become increasingly important players in this process.

Human and Institutional Development

Through these collaborative networks, researchers in developing countries gain access to new technologies, and their countries are guided in developing the institutions and human resources necessary to increase and sustain agricultural productivity. In the Asian countries already mentioned, as well as in Bangladesh, India, Thailand, and Sri Lanka, and in several Latin American countries such as Brazil and Peru, institutions were built, hundreds of thousands of individuals received some technical training, and tens of thousands of young professionals received master's and Ph.D. degrees. Not only was their knowledge-base broadened, but their education and training were specifically tailored to the agricultural needs of their countries.

Agriculture as the Driving Force in Development

It is with good reason that the international assistance community has emphasized the development of organizations that focus on agricultural improvements in research, irrigation, fertilizer use, finance, marketing, and so forth. A successful agricultural sector has been the driving force that leads to overall economic improvements in almost all developing countries. This is because 60% to 80% of the people in these countries live in rural areas and earn their livings by producing food. Technological improvements in agriculture lead to increased farm incomes which create increased demands for farm and nonfarm goods and services.

These demands, in turn, expand employment both inside and outside of the agricultural sector (Mellor, 1986).

Population and Family Planning

Family planning is another area in which we have made significant progress. New contraceptive mechanisms—pills, interuterine devices, long-lasting subdural chemical implants such as NORPLANT®, and others—have been developed and widely disseminated. Efforts continue to develop a wider array of appropriate, inexpensive, easy-to-use contraceptive technologies, and to identify socially-relevant channels for distribution of family-planning information and materials. These endeavors have helped to slow worldwide population growth and have increased our ability to feed the human family.

Environment and Natural Resource Conservation

But, as world population continues to grow, albeit at a slower rate, USAID and other U.S. federal agencies, as well as institutions around the world, have become increasingly aware of the crucial need to conserve our planet's biological resources. Strategy conferences on tropical deforestation in 1978 and on biological diversity in 1980 led to the formation of federal interagency task forces and amendments to the Foreign Assistance Act to address these issues. A National Forum on BioDiversity, cosponsored by the Smithsonian Institution and the National Academy of Sciences in 1986, provided an opportunity for experts in ecology, tropical biology, conservation, economics, and other related disciplines, to review and assess the consequences of the earth's continuing loss of genetic diversity.

In keeping with its particular mandate, USAID is working with developing countries to help them conserve their biological resources and habitats. Natural resource or environmental assessments are completed or in progress, some with support from the agency, in 28 countries, and national conservation strategies are completed or underway in 21 countries (IIED and IUCN).

Intensive efforts are underway to identify fast-growing, multipurpose tree species that will be most suitable for use in reforestation and agroforestry efforts. The goals are to meet the basic needs of developing countries for fuelwood and other tree products, to improve land, water, and human resource management, to increase the employment and income generated by businesses that are based on forestry products, and to identify tree species that may be most productive in farming systems that combine the cultivation of food crops and trees.

Women in Development

The contribution that women can and should make to development is receiving wider and more careful consideration in all agency endeavors, and particularly in terms of agriculture. Women in developing countries are frequently involved in growing, harvesting, and marketing food, as well as in processing, storing, and preparing it for consumption by their families. The visibility and expertise of these women must be increased through better education and training, and involvement in a wider variety of activities that support and improve rural life in the developing world. USAID is working to more fully integrate women-in-development considerations into initiatives that involve not only food preparation and nutrition, maternal and child health care, and family planning, but

also agricultural production and marketing, micro-enterprise generation, and general preparation of the female members of society for new roles in the development process.

AREAS OF LESS PROGRESS IN SUBSTANCE AND PROCESS

The many exemplary ways in which we have been able to make a real difference in the substance and process of development offer considerable hope and encouragement to governments, private voluntary organizations, and the private sector. There are, however, several development areas in which our efforts have yielded less-than-desired progress.

Increased Rural Income and Equity of Distribution

The still-great inequities that exist in income and income distribution in so many countries, particularly in rural areas, is one such issue to which we are again giving increased attention. There have been, to be sure, some successes, primarily in what we refer to as *graduate* or *middle-income countries*—those countries which have attained a per capita income level that precludes bilateral development assistance from the United States. In the much larger group of least developed countries, per capita income is often far too low and undependable to provide adequate food, clothing, shelter, health care, and education. While most countries have not lost ground during the last 25 years, neither have they gained much.

Literacy and Education for Females

One major barrier to development in less developed countries is lack of access by large population segments to at least a primary education. Although some progress has been made, one area is often lacking in momentum—female education.

Africa, for example, has special problems in this regard. If any one thing is limiting development in that continent, it is lack of access to education, particularly for girls and young women. Only about one-third of African mothers can read and write. Quite apart from the development consequences for their children, this lack of literacy severely limits their access to health, population, nutrition, agricultural, and other information that would help them to improve their own lives and those of their families and communities. Education—the simple ability to read and write—gives people

a fighting chance to learn new technologies and make some beneficial changes.

Private Sector Involvement and Policy Dialogue

Notwithstanding some of our successes in fostering appropriate environments for business and market development, we must begin to put even greater emphasis on the involvement of the private sector in development, both in the United States and in the countries we assist. The private sector of the U.S. agricultural community has a vast store of knowledge and expertise to offer in the production, processing, and marketing continuum. Private-sector efforts in developing countries can reap important benefits from access to the know-how of successful U.S. entrepreneurship. Access and exposure to American business acumen can be a powerful stimulant to the development of new enterprises and to new market reform initiatives. In this regard, it should be emphasized that minority-led enterprises can perform important catalytical roles, much in the same way that female entrepreneurs can help enhance the economic potential of women in developing countries.

To help their citizens take advantage of this valuable assistance, developing countries must design and implement policies that facilitate free access to markets for inputs and outputs at satisfactory and stable prices. Agricultural development, in particular, is stimulated by a healthy business-oriented environment in which farmers and other entrepreneurs have such access.

The task before us is by no means simple, nor does it lend itself to quick solutions. Because economic and political policies do not always have the same goals, we must help developing country leaders to recognize the less obvious, longer term benefits that only market-development oriented economic policies can generate. This learning process must involve not only culturally knowledgeable political and economic analysts, but also scientific researchers and technologists, in addition to the leaders themselves.

Sustainable Agricultural Development and Extension

Developing country officials must also be made far more aware of the ecological consequences of poor development choices. Beset as they are by day-to-day crises, developing country leaders tend to give insufficient attention to the longer-range destructive effects of inappropriate practices, particularly in agriculture and forestry. As the earth's population increases and more land area is used to produce needed food, fuel, and fiber, attention to natural resource

conservation becomes even more vital. Clean water, productive soil resources, and habitats for our unique and irreplaceable flora and fauna become scarce and must be husbanded if agricultural productivity and healthful human and animal life are to continue.

We must give greater attention to farming systems that can be maintained in the many areas where tropical soils are fragile and more easily leached of their valuable nutrients, and to plant species that can thrive on such fragile soils. USAID has helped to introduce the *farming systems research and extension* (FSR/E) approach into developing country agricultural research to improve coordination and cooperation among researchers, extensionists, and farmers. This comprehensive approach helps prioritize research and allocation of scarce research funds, increases the potential for successful transfer of innovative technologies through on-farm testing, and helps overcome existing gender, age, cultural, and economic biases in all stages of technology research and dissemination. FSR/E and similar innovations that can successfully transfer improved technologies contribute to resource conservation which is crucial to sustainable development.

THE MOST CRITICAL WEAKNESS OF THE PROCESS

Ultimately, the effectiveness of the development process is weakened by discontinuities, both external and internal, to which the USAID system is subject.

First, many discontinuities are caused by political changes or instabilities that occur in the recipient countries themselves.

Second, discontinuities are caused by our own political changes (shifts in the congressional mandate), the fluctuating concerns of an administration, and many other changes that impact on the agency's direction and emphasis.

Third, discontinuity can be precipitated by the natural impatience of the American public. When the long-term needs and goals of some development endeavors are modified to respond to shorter-term concerns of public opinion, the potential positive impacts of the programs on, for instance, fostering long-term agricultural market-development designs, may be severely damaged.

A fourth kind of discontinuity comes about because of USAID's rotating personnel system. In the field, in particular, individuals who implement programs are rarely the people who developed the original design. Because they each have a unique set of experiences and motivations, this may lead to somewhat different interpreta-

tions of a specific project's format and intent. Finally, there is discontinuity that can be attributed to the concept that USAID is a temporary agency, even though it celebrated its 25th anniversary last year.

In facilitating our process, we must focus on consistency and follow-through to minimize the detrimental effects of discontinuities over which we have no control. USAID has a well-developed programmatic system. As we strive to improve it, we must be careful "not to throw out the baby with the bathwater."

AREAS OF SUBSTANCE AND PROCESS WHICH NEED GREATER ATTENTION

Several areas of substance and process should receive greater attention. In future efforts, the United States ought to provide leadership in program areas in which we have distinct comparative advantages.

Human Resource Development

One obvious area is human resource development. Our American institutions of higher education, including our land grant and historically black colleges and universities, are unrivaled as a channel to educate foreign nationals who come to the United States to study toward advanced degrees. We are also well-equipped, through our own vast, successful experience with public education, to help other countries increase the impact of their educational dollars and provide more accessible and appropriate education and vocational and technical training opportunities for their citizens.

We are also capable of doing far more in helping to increase the opportunities for women to participate in the development process at all levels. In this endeavor, we are joined by the international agricultural research centers and other research institutions that are becoming increasingly conscious of the valuable role and potential contribution of women in agricultural production and marketing, as well as in scientific and advisory positions within the agricultural research system.

Private Sector Enhancement

Another area in which the United States has a distinct comparative advantage is private enterprise generation. We do not recommend private-sector growth for ideological reasons alone. For many

aspects of a country's economy, private enterprise, both large and small, can provide goods and services more cheaply and efficiently than can the cumbersome systems of the public sector. In addition, as has been so graphically demonstrated in the People's Republic of China in recent years, it is human nature to work harder and with more enthusiasm when the extra effort increases personal income and the quantity and variety of accessible goods and services.

Such tangible incentives are just as enticing for other very poor nations whose people—farmers, craftspersons, technicians, and others—would like to have greater control over their own productivity and success, but who are impeded by the maze of old and new regulations and by other barriers intrinsic in so many public sector endeavors. In recent years, for example, the agency has carefully examined the circumstances that limit or support the success of small-scale businesses (micro-enterprises) and determined that, where credit is a product of the private sector through local savings, new, small-scale businesses are more likely to thrive. We are working to disseminate this kind of valuable knowledge and have begun to see some fruitful results in both rural and urban communities where these lessons have been put to good use to stimulate economic output through well-managed savings and credit systems.

Biotechnology and Other Modern Technologies

The newer research technologies must be acknowledged as important tools in development research. When used to augment more traditional modes of research, the methods of modern biotechnology make it possible for researchers to rapidly develop highly-useful technologies. Research supported by USAID is already using the new methods to develop improved animal vaccines, increase biological nitrogen fixation, produce plant varieties that can tolerate stressed soil and environmental conditions, and many related efforts. The door is now open to innovations not even dreamed of only a few years ago.

U.S. soil taxonomy is another recently-developed tool that is proving to be very useful in developing countries. Combining soil classifications along with crop, water, weather, pest, and management-practice information in computer simulations, researchers can predict crop success and identify optimum combinations for given locations in a fast and cost-effective manner.

Valuable information about weather, natural vegetation, soil, and forestry conditions is also becoming increasingly available through satellite imaging. The products of this new technology can help environmentalists and other development professionals track

natural resource trends so they can predict potentially hazardous conditions in a manner that allows for remediation.

As more scientists are trained in the new disciplines, and as the methods themselves become more cost-effective to use, we will be able to increase their application to the most pressing development problems.

In many countries of Asia and Latin America, a combined use of these and more traditional technologies has moved development forward dramatically during the last 25 years. But much remains to be done. Vast areas, particularly in Africa, will require new development and investment strategies to overcome problems with which we have not yet come to grips.

University Building in Africa

Africa is the continent that can now most clearly benefit from an increased ability to generate and apply improved agricultural technologies. The variety and magnitude of agricultural constraints in that region are probably the worst in the world and have contributed to a decline in per capita food production over the last 20 years. Farmers in many parts of Africa must produce crops under different and very difficult conditions that often include low and unpredictable rainfall, acidic and infertile soils, and unique and hard-to-control animal and plant pests.

Many Asians feel that the most important long-term outcome of development assistance was the building of university systems, sometimes very similar to the American land-grant model, that gave them the capacity to carry out their own agricultural research, educate their own researchers and technicians, and become the guardians of their natural resource base.

We are now beginning to mount a similar 20 to 25 year effort in Africa. Within this plan, African countries will develop the capacity to generate improved agricultural technologies that will help them feed growing populations while they conserve their natural resource base and educate their own teachers, researchers, and extensionists.

In addition to taking advantage of concepts that have been proven valid elsewhere—including policy dialogues, involvement of women, institutional development, sustainability, and private enterprise generation—this effort accesses the skills already available in established research institutions such as the international centers, the CRSPs, and various national and regional programs. Finally, it employs the new development agendas that are particularly appropriate for Africa's unique problems such as agroforestry, encouragement of very small-scale enterprises, and particular

attention to overcoming some of the most damaging plant and animal pests that are unique to Africa.

USAID's plan for Africa is comprehensive. We plan to strengthen national agricultural research systems in about eight core countries. At the same time, strong applied research capacities will be built in neighboring countries so that local scientists can borrow technologies and adapt them to local needs.

Stimulated through a special program for African agricultural research critical cadres of scientists from different countries will network their efforts to improve four to six priority commodities. And, perhaps most important of all, in four to six of the countries in which we are strengthening the agricultural research systems, we will provide long-term assistance to build strong faculties of agriculture.

BASIC AND APPLIED RESEARCH: NECESSARY ELEMENTS TO ENHANCE AGRICULTURE

Not only in Africa, but throughout the developing world, research, both basic and applied, is needed to improve all aspects of agricultural production, processing, and marketing. The high-input systems that created the green revolution elsewhere depend on continued research to combat new, more-tenacious plant pests. No single improved crop is ever a permanent solution. Lower-input systems that may be more appropriate in fragile environments often require very dedicated development of technologies, as well.

Research efforts are yielding improved crop varieties—salt tolerant rice and oats, aluminum and drought resistant sorghum, and viral-resistant bean lines to mention a few. Ruminants, important in Africa because they are smaller and easier to raise, are also receiving research attention. Vaccines and other treatments for a number of sheep and goat diseases have been discovered in recent years including a rapid diagnostic test and vaccine for contagious caprine pleuropneumonia, a disease affecting at least 48 million goats in West Africa and Asia, and a treatment for a severe white muscle disease that could save over 1 million lambs per year.

Depending on a developing country's own research capacities, the international research centers, U.S. and overseas universities, and public and private research institutions offer assistance or collaboration as appropriate. While most of the African countries will require technical assistance for many years to come, the Indo-U.S. Science and Technology Initiative is a good example of scientific collaboration between countries at somewhat different levels of

development in which research capabilities are high.

In all of this, the United States continues to focus on endeavors for which we have a critical advantage. As developing countries, such as India, become more adept at disseminating what they have learned in the development process, we encourage them to assist other less developed countries. We also encourage countries to work together on common problems with marginal support. In the larger donor community, we try to foster open channels and the kind of cooperation that gets the most "bang for the buck" out of every development dollar.

Only a few decades ago, the United States was virtually alone in the development assistance field. The format of our aid effort set the pace for participation of other industrial countries as their economies reemerged from the catastrophe of World War II. Likewise, many of the developing nations we helped in the 1950s and 1960s, such as Brazil, India, Indonesia, Israel, and the Philippines, are now innovative contributors to or collaborators in the substance and process of helping other emerging nations. Many of those countries have developed critical areas of expertise in which they excel—such as in construction of roads and buildings—which should be and are being harnessed in the assistance arena.

In the wake of the second World War, we had the critical advantage of being a catalyst for position change. As we look back, we know that the substance and process of our American contribution were the keys to the doors of development. When we first unlocked those doors, we did not know and greatly underestimated the needs of the countries behind them. Today the problems and solutions are somewhat different, and they are part of a global picture we helped to build. Today we know what is behind the door. The progress we have made should be an inspiration as we lay the groundwork for the global challenge ahead.

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MARKET DEVELOPMENT AND ECONOMIC DEVELOPMENT: CONTRASTS AND COMPARISONS

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During my career, I held an assignment in economic development with the U.S. Agency for International Development (USAID) and, at the present time, I work in market development with U.S. Wheat Associates. This contrasting set of assignments was punctuated by a stint on the staff of the U.S. Senate. Thus, I can perhaps offer a unique perspective on development.

In contrasting the two worlds of market development and economic development, it would first appear that they are largely separate and quite different in approach. During my years with USAID, the assumption of the organization seemed to be that they were pursuing *development* and that this pursuit was somehow a holy cause and purpose. The word development was associated with being selfless as opposed to being selfish. The focus of concern was the total economy of a particular country, although the particular sectors of concern in a country's economy were usually agriculture or some other related areas. There was little emphasis on education or literacy programs.

One of the main unspoken aspects of USAID's economic development picture was the idea that programs should not be attuned to short-term political objectives. The State Department might want to reward or punish a country for some particular behavior, but USAID projects were not well suited for, nor should they be used toward, this end. USAID also interpreted development to mean taking the long-term view of its activities rather than the short-term view. Unfortunately, the word *economic* was often dropped, and the discussion focused just on development.

In the case of economic development, the focus has often been on either self-sufficiency or self-reliance, with developing countries attempting to produce as much of their food needs as possible in order to reduce the cost of food imports. Often a country tries to produce commodities for which it has no economic advantage. This action can create conflict with market development groups that would prefer to have other countries purchase their food commodities from the United States. The crux of this issue lies in one's view

of economics and how a country can best pursue an economic development program.

In market development, the objective is to sell or export your product in a particular country. The focus is usually on a commodity or sector such as, in our case, the wheat food industry. In this example, our organization focuses on the wheat food sector, beginning with buying through milling and baking and sometimes including product promotion. In the case of the Feed Grains Council, they often conduct feeding demonstrations to show that better animals can be produced more efficiently with improved feeds. Other cooperators also try to increase their commodity export sales through similar programs.

A market development program is tailored to meet a country's needs, whatever its level of development. For most countries, the task of market development is rarely completed. U.S. Wheat Associates began its efforts in Japan after World War II, and today, Japan has a developed milling and baking industry. However, with the competition from other exporters, a continuing program is needed to maintain our market share. In fact, we sometimes send Asian technical teams to Japan rather than bring them to the United States.

Some in market development feel that the development groups often pursue programs that are not sensible in terms of the economics of a particular developing country. Korea and Taiwan are often cited as great success stories, but their success was not in agriculture. Their success has been in industry, and it is doubtful that they would have had such success if they pursued the same policies in industry as they pursue in agriculture.

The assumption behind the market development work of cooperator groups such as U.S. Wheat Associates is that we can work with a sector to bring about the improvements that will help it to grow and develop. This effort involving the millers, bakers, and buyers can involve the government, the private sector, or a combination. The approach is based on the idea that we can increase the demand for U.S. exports by helping to improve the quality of a country's wheat food products and the profitability of the local industry. Through new and improved products and increased profitability, an expanding market can lead to increased employment and a useful form of development that is often ignored by the development community. This effort requires a continuing commitment to stay in touch with the key decision-makers in the industry.

Our belief also is that if U.S. producers are competitive, we will derive a significant share of a country's expanding demand for wheat imports. A recent study by the Agricultural Policy Group pointed out that the United States enjoys a competitive advantage

in agricultural production and is still competitive with agricultural producers anywhere in the world. One additional advantage cited in that study was our large unused production and marketing capacity that can be called upon as future food demands rise.

We have, as producer representatives, a major concern about encouraging competing crops, especially where it would appear to make poor economic sense. Our farmers feel that they have taken steps to be more competitive. They have taken land out of production in order to bring supplies in line with world demand. Thus, it appears to make little sense to encourage production where the economic return is low and the country does not have a comparative advantage. We were very unhappy last year when it appeared that USAID wanted to encourage Egypt to increase its wheat production to reduce its dependence on imports. It was clear that its producers could obtain better returns from other crops, and so were not eager to grow additional wheat. In addition, given the nature of Egyptian agriculture with its intensive, small, irrigated holdings, growing wheat would not appear to make economic sense.

An important quality factor also enters into the economics of wheat production, but this is often ignored by the development community. All wheat is not alike. Five classes of wheat have been developed in the United States to meet particular product needs. Other wheat exporting countries have developed their wheats to meet similar needs. A developing country cannot simply try to grow wheat without being aware of the state of development in the industry. Otherwise, its milling industry will have to work around and blend off its poor quality wheat. To increase production of wheat that is of poor quality and more expensive than world market wheat is not a good use of resources.

A recent sample of misguided economics is Saudi Arabia's attempt to be self-sufficient in wheat. Saudi Arabia began this exercise despite admonitions from some experts, but with the notion of building food security. In the beginning, the government paid producers over $1,500 a ton to produce wheat, and later reduced that to about $500 per ton. Because of these very high support levels, wheat production increased sharply, and Saudi Arabia recently has been selling its excess wheat on the world market, for about $95 per ton. Some have argued that, as its water tables drop, the program will become too expensive even for Saudi Arabia. This hardly is an example of sound economics, but I understand that the Food and Agriculture Organization of the UN recently awarded some kind of recognition to Saudi Arabia for becoming self-sufficient in wheat.

I would not begin to suggest that the market development community has been without its failures, but the market develop-

ment approach of the cooperator groups can offer some guidance for helping developing countries to grow, prosper, and develop new wealth. I am afraid the development community does not always understand that process or why they are often criticized.

Recalling past experience and looking ahead, one of the most likely developments would be another reorganization or study of USAID but a new name or another study is not needed. What is needed is a new approach with the emphasis oriented toward discovering what countries can do to help their economies to grow. This also does not necessarily mean implementing the programs desired by the developing country.

An existing program, Public Law 480 or Food for Peace, needs to be made more flexible and streamlined if it is to realize its potential as a tool for export promotion. Run by a committee, it is one of the worst examples of how to operate a program. It has been sold on humanitarian and market development grounds, but because of the way the program operates, too much of the commodity is delivered in the last quarter of the fiscal year. This method of operation ignores the need for flour mills to have a constant stream of commodity throughout the year. People eat 12 months a year, not just in the final quarter of the U.S. fiscal year.

A new program utilizing local currencies under Section 108 of Public Law 480 could be useful for export promotion, but the details have not been worked out.

While all economic development programs need a fresh start, increased funding appears unlikely. In fact, one reason for a new approach is to attempt to develop programs that are effective with reduced funding. With a new administration in the offing and reduced dollar and food resources expected, the greatest possible return from available resources becomes very important.

We also might be at a new plateau in the food supply cycle. The World Food Conference of 1974 ushered in all sorts of fears about scarcity while during much of the 1980s we faced surplus supplies and concerns about depressed prices for raw materials. While it may be too early to predict scarcity, commodity prices have begun to increase, stocks have declined, and some raw commodity prices such as copper have increased recently.

Some in the development field think they have a political problem and that they need to do something to win support from the private sector. If the right "something" is done, according to this view, they can then get a new lease on life and get back to business as usual. This is not likely to happen. Future economic development programs will need to be more relevant and more oriented toward the economic interests of the developing countries and the United States. The task will not be easy, but we will need to help

developing countries become a more integral part of the world economy by helping them begin to open their economies and to make sound economic decisions. Such an approach will require leadership that is realistic and has a pragmatic understanding of economics.

To get the support that it seeks, the development community will need to convince the public that it is helping developing countries to become customers and active players in the future. This will not preclude all controversy, but if the effort succeeds, developing countries will be the new markets for the future.

Seen from this standpoint, economic development and market development will not be inconsistent or two separate worlds. They will be working toward the same goal from different directions.

FOOD, HUNGER, AND AGRICULTURAL ISSUES

Dean Kleckner
President, American Farm Bureau Federation

Several observations and reports may help us keep our perspective as we examine world agricultural issues bearing on food supplies and human hunger:

- It has become increasingly difficult to deliver direct food aid to those in need, regardless of the severity of that need.
- Although famine exists in several parts of the world today, world hunger estimates are greatly inflated.
- World hunger is not a reflection of inadequate food production, and food aid is not an adequate answer to most starvation problems.
- Reactionary, totalitarian local governments deliberately create many of the hunger and agricultural development problems that we are trying to solve.
- Any lasting development assistance program must begin with agricultural development.

What are the facts backing those apparently contradictory assumptions? For one, anybody studying aid and hunger patterns soon is struck with the apparent fact that world food supplies have been steadily rising and are more than adequate to feed everyone as food production continues to outpace population growth.

China has become food self-sufficient. India and even Saudia Arabia have recently produced grain for support. Likewise, Indonesia and Thailand have made tremendous gains in food production. Excess food production and low commodity prices worry producers over much of the world. These facts fly in the face of what is supposed to be common knowledge—that much of the world goes to bed hungry every night.

A while back, officials of the World Bank stated that only about 5% of the world suffers from any degree of malnutrition.

Thomas Poleman, who teaches agriculture and life sciences at Cornell, has been studying world hunger for the past 30 years. Poleman says world hunger estimates are highly inflated and that this exaggeration—much of it done by international agencies—causes several problems. It can result in people believing that the hunger is so overwhelming that it simply cannot be handled, or that the need for aid is so blown out of proportion that very real

problems are discredited.

Poleman says that estimates of world hunger vary anywhere from 1.2 billion people to "only" 400 million. He points out that 1.2 billion people equals one-third of the total population of developing countries and, he says, without minimizing the gravity of world hunger, it is ludicrous to think one-third of the people in these developing countries go to bed hungry each night.

Were this so, Poleman says, life expectancy would be falling, not rising as it is, and there would be tremendous and continuous outcries for assistance. Poleman has concluded that perhaps 100 million people are malnourished, not that such a figure is at all comforting or acceptable in a civilized society.

What is pertinent to this discussion is the relatively small amount of food that could solve most of the problem. It is thought that an adequate diet for these people could require as little as 5 million tons of grain.

That, of itself, may sound like a large amount, and surely it is a lot when you consider the problems involved in moving food grain to where it may be needed. But 5 million tons is a minor amount when compared to something like 200 million tons of grain that are traded every year, or when compared to around 2 billion tons that are produced in the world annually.

Even so, starvation continues. In some areas starvation is actually growing. Sometimes the monsoons fail, or there are distribution problems. But these are not the basic causes of most famine. This apparent paradox needs careful examination.

A chilling news item arrived when most of us were celebrating the Christmas holidays.

According to a *World Press Review* report,

> Both sides in the current Ethiopian civil war find food as valuable a weapon of war as the Kalashnikov rifle. The Eritrean rebels, in the country's northernmost region, furnish the hill people with food, most of it donated by the United States.
>
> The poor families, such as Kadija Mohammed Omar, a mother of five, credit the rebels for the food. Those who control the roads control the food. The government supervises the lion's share of the tons of donated foods. It, with its huge standing army, can decide where the food is distributed.
>
> Western officials say a 'food truce' is needed, but, for both sides, a glut of relief food could upset war strategy.

That's the end of what must be considered a most disturbing report.

How in the world do we, as concerned people, work constructively in such a setting? Last year's famine seems to blend into this year's famine and that of the year to come. What is to be done as famine and death are deliberately unleashed on hapless citizens by their own government?

Objectively, this is not an unusual circumstance. Some form of the castle siege has always been a tool of war. Supply depots have always been top military targets. "Starve them out!" has long been the battle cry.

There are many myths about world hunger, perhaps as many as there are about agriculture itself. The greatest of these (and one that needs to be dispelled) is that famine is primarily caused by natural forces rather than by a long list of human actions ranging from indifference to all-out war.

In one report, we are told that Mozambique, a nation that formerly exported food, now produces less than 10% of its food needs. Only a year ago, a United Nations appeal brought a tremendous outpouring a relief aid to this part of South Africa. Quoting from the release: "Crops routinely are looted or destroyed by bandits, unsafe roads limit the peasant's ability to bring crops to market..."

Relief workers tell of kidnappings, rape, mutilation, and ambushes as well as starvation. Please note that under these conditions, hunger goes to the bottom of the list.

From studying the reports, one learns that the word *bandit* is another term for *rebel* with the titles freely interchangeable. Call it what you will, this is a power struggle, a civil war between some of a country's citizens and their own government.

We must not blind ourselves to the fact that a very large part of the food and economic problem in many lesser developed countries is tied to such things as mismanagement, internal corruption, blind political ambition, and an all-out search for personal power.

Objective analysis shows that at most, government-to-government aid can have only a marginal impact on development efforts in the third world. Far too often, aid flows to reactionary governments to promote further centralized economic planning, government ownership of the means of production, and incredibly wasteful and ineffective public expenditures.

It is typical of lesser developed countries to want to develop faster than either their resources or our resources will permit.

In any number of countries, unrealistic national priorities virtually preclude a prosperous farming industry. Third world countries continue to buy most of the guns and other armaments now for sale in the world. Setting up and lavishly equipping a national army is one of the first things done by most governments of emerging countries.

Having said all this, let me inject this positive note. U.S. farmers generally, and Farm Bureau members specifically, approve assistance programs to help less-developed countries become more stable and self-sufficient.

Farmers have generally supported world food aid through such agencies as the Food For Peace program. We are proud that Farm Bureau members originated the Food For Peace idea more than 25 years ago.

We at Farm Bureau think the Food For Peace Program—Public Law 480—should be expanded, particularly in those parts of the world plagued with hunger problems. Whenever feasible, we feel that foreign aid under the program should be given in the form of agricultural products rather than cash.

We think this aid, in whatever form and from whatever source, should be aimed at encouraging private enterprise economic systems. Farmers recognize that handled properly, aid programs can encourage spending discipline, help realign spending priorities, increase market incentives, and strengthen private enterprise.

All these things are necessary before nations can emerge as productive members of the world community. True national development begins with agricultural development. All of the world's healthy national economies have a strong agricultural base—even those with limited arable land.

Led by a strong agriculture and rising income, developing nations move into world markets where they frequently become customers for our farm commodities and value-added products. The rapid growth of U.S. farm exports to South Korea, Taiwan, Singapore, Indonesia, and Malaysia shows how this can operate.

Developing countries now buy about two-fifths of all U.S. farm exports and few people question the tremendous potential for expansion of such trade. The largest share of these exports go to those third world countries where agricultural development has been most successful.

But we would stress that developing countries depend strongly on the openness of markets in the industrial west, while often remaining reluctant to open trade doors to us. These governments need to be encouraged in this regard.

I have stressed the values of private enterprise in the production of food and relief of hunger. It is my observation that a sound national economy is generated from the power of two relatively rare conditions: personal freedom and incentives of the marketplace. Ignore these and chaos presides.

To our member farmers, the only aid programs that make sense are those that are built on a strong self-help foundation. Included must be a demonstrated willingness on the part of national leader-

ship to remove deliberate disincentives to production.

Great care must be taken in everything we do to prevent our aid from either crippling personal enterprise or causing governments weaned on foreign aid and borrowed money to use it to play "King of the Hill" while avoiding the realities of hard work and long-term solutions.

The best thing we can share with others is the knowledge of what private enterprise, encouraged by the incentives of personal profit and sharpened by the possibility of personal loss, can do to build agriculture, build people, build nations, and build a sound future.

INTERNATIONAL AGRICULTURAL DEVELOPMENT: BENEFITS OR MYTHS?

Len Richardson
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As you may know, I have written a couple of editorials which many in the U.S. development assistance fraternity have interpreted as anti-international development. Such a label automatically makes me against humanitarian concerns, world peace through food, and perhaps worst of all, against some of this nation's greatest institutions—the world-class university system, the U.S. Agency for International Development, and the Feed Grains Council.

This may come as a shock, but I am not against any of these institutions. Instead, as a journalist, I am trying to raise issues so that those in agriculture, and especially those in international development, will begin to direct change. The myth is that development programs do not have to change. The reality is that U.S. and world agriculture are changing and it is time to refocus and develop a strategy for the times. Consider a few myths and facts:

MYTH: Less developed countries are our fastest growing markets and U.S. farmers are the major benefactors of this growth.

FACT: There is enough truth in this statement to make it believable because the 10 developing countries with the fastest rates of growth in agricultural production increased their food imports by an average of 68%. And indeed, developing countries with slow agricultural production growth showed little or no growth in food imports.

While it is true that U.S. bulk commodity producers (corn, wheat, soybeans, etc.) have gained markets from these efforts, the big gainers have been money center banks and foreign investors with processing and distribution interests.

Consider the situation in Latin America. According to a study by the Joint Economic Committee of Congress, nine U.S. money center banks made loans that equaled 176% of their combined capital. Before the debt crisis, this kind of agricultural development apparently worked. Latin American purchases of U.S. farm products totalled $6.9 billion, or 15% of total U.S. farm exports. Put another way, exports to Latin America from the United States

exceeded exports to the Soviet Union by 240%, or $4 billion. By 1985, these ag exports fell to $2.4 billion.

And how does the United States cure this problem? It asks money center banks to continue such financing and to profit from exports from these countries, according to the report. In fact, by 1983, while the U.S. government and the International Monetary Fund were making emergency loans to keep debtor nations solvent, money center banks tripled the spreads they were charging on rescheduled loans. The World Bank has made new loans to Argentina under the condition that it reduce its tax on ag exports to expand farm exports by 6.5%.

And how do U.S. processors respond? According to the congressional Office of Technology Assessment, U.S.-based multinational companies will choose to penetrate foreign markets by investing in production and distribution facilities, instead of through exports. It is the same lesson that the big grain traders learned long ago: There is more money in controlling distribution than in production. U.S. investment in the foreign food industry reached $23.4 billion in 1986.

And yes, many of our U.S. growers are also rushing to Mexico or somewhere else to cash in on the trend and cost advantage. In fact, imports of fresh and frozen vegetables were 332% higher in 1986 than they were in 1975.

MYTH: International trade regulations will pressure developing nations, despite their labor advantages, to only produce bulk commodities when they have a clear comparative advantage.

FACT: While national economic self-sufficiency is generally a costly and inefficient way to develop the world's resources, politically most countries, especially capital hungry third world countries, will seek self-sufficiency in competition with the U.S. Even Japan, the world's most industrialized country still seeks self-sufficiency in agriculture—especially rice.

MYTH: U.S. agricultural technology is always best for developing nations because it will increase production.

FACT: A high-yielding agriculture is not necessarily a sustainable agriculture. While the International Rice Research Institute's technology packages worked wonders in India, published reports indicate that new varieties were affected by 40 insect pests and a dozen diseases, many of them serious enough to cause appreciable economic losses. A survey by the Food and Agriculture Organization of the UN showed that more than 50% of the farmers in the same state applied more than the recommended fertilizer.

Agrichemical companies are now international (only four are expected to be U.S.-based) and are using developing nations as a testing ground. Still, all major global agrichemical firms have to be

players in the U.S. market. Thus, badly needed improvements in our Federal Insecticide, Fungicide, and Rodenticide Act are the best hope for safe application worldwide.

MYTH: Superior U.S. agricultural technology assures that the United States will always be number one in technology.

FACT: This is not the production era, it is the age of information and it spreads rapidly in today's world. In the new international agriculture, U.S. agriculture has a shorter advantage span than in the past. International patent data indicates that the United States is a leading exporter of ag and postharvest technology. U.S. inventors obtained a foreign agrichemical patent abroad for every one that they received a home. That data also shows that foreign entities obtain between 24% and 52% of all ag-tech patents.

The conclusions from all of this are both simple and complex. Most notable is that agricultural production is increasing in developing countries and stabilizing or even declining in the United States. Even U.S. agribusiness firms have recognized this trend and have merged or gone to where the profits are available.

Other observers have noted that increases in agricultural technology transfers labor out of agriculture. In this regard, D. Gale Johnson has stated bluntly "Agriculture must decline." This statement does not mean that agricultural productivity declines, but that agriculture's share of the economy declines.

I would suggest that we may have arrived at a new reality: When you transfer agricultural technology, you may also shift more than the labor sector of the economy. What we are probably seeing is a shift in the production of bulk, nonvalue-added commodities to the lower-cost developing nations.

This shift is not necessarily bad, because the United States can capitalize on the development of value-added commodities, or, with the help of biotechnology, define value-added characteristics of bulk commodities. The same knowledge may also help us stay competitive with certain bulk commodities by lowering our cost per unit of production. Nevertheless, it is a new reality which apparently has yet to be recognized.

Such change for U.S. agriculture means that we are going to have to shift emphasis from yield to quality. To compete, farmers must learn to market quality or unique values uncovered by biotech, not just corn or soybeans.

Finally, there are some lessons for people in international development. Agriculture is moving away from a single farm economy of scale to a systems economy of scale. How can the United States profit from such a development and help the developing work in the process?

In the past, international donors have tended to divide up the pie between planners and implementors as well as by crops, regions, stations, or scientific disciplines. The lesson of the new science is an integrated, systems approach. This same kind of holistic approach is needed in the planning of international research efforts and the responsibility for their implementation, to say nothing of political integration.

It is also obvious that donor goals and reward systems must be long-term, not the donor first, or even the U.S. farmer first. But swings from equity to efficiency or quick poverty cures won't work. In short, you need to be more concerned about new ideas (the Minnesota Food Stamp idea is worth considering), and fundamental changes rather than proving the ideology that helping developing nations improves U.S. farm exports. If you find an integrated approach, U.S. agriculture is sure to gain.

PART 4

FOOD AID: ALTERNATIVES AND ANALYSIS

USING U.S. FOOD SURPLUSES FOR DEVELOPMENT: INTERACTION OF FOOD AID WITH OTHER FORMS OF FOREIGN ASSISTANCE

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The current world food situation is dramatically different from that of a decade ago. In the mid-1970s, the world was beset by acute food shortages; today, it appears to be awash in food. Only a decade and a half ago it would have seemed naive to analyze food security as a distributional problem; the physical inadequacy of global food supplies was too readily apparent. However, in the late 1980s, it now seems reasonable to focus on food insecurity as the inability of poor countries, poor families, and poor individuals to purchase sufficient quantities of food from existing supplies.

Today's global food situation is one of acute structural imbalances. In the developed countries, supply is growing far more rapidly than demand, but in many developing countries the situation is reversed. In the near future, such imbalances are likely to continue, presenting a major opportunity for advancing food security through food aid.

In many ways, the present food security situation is far more complicated than scarcity amidst plenty. For most of Asia and Africa, and even for much of Latin America, improving food security requires both increasing the purchasing power of the poor and boosting overall food production. This is true because of the importance of food prices in determining the purchasing power of most low-income people, and because of the dominant role of agricultural production as a source of employment for the poor.

These factors suggest the following two-pronged strategy to promote food security: In the long run, raise the overall level of food production in the third world to increase the purchasing power of the poor. And in the short run, redistribute food supplies from the developed to the developing world to meet the immediate food needs of the poor.

AGRICULTURAL GROWTH AND ACCESS TO FOOD

In the developing world, agricultural production must be stimulated through cost-decreasing technological change. The small farm must be at the center of this effort. Food must be transferred from the food-surplus nations to the food-deficit nations through mechanisms which boost the purchasing power of the poor while also increasing the incentives to raise agricultural and food production over the long run. The gross instability of food availability and purchasing power of the poor must be reduced, without prejudicing long-run efforts to increase food supplies and purchasing power.

The comparative advantage of low-income countries lies in their ability to mobilize large, low productivity labor supplies for increased production. That labor supply is itself the product of two interacting markets—the labor market per se and the food market (Lele and Mellor, 1981). The high marginal propensity of the poor to spend on food requires more food to back up more employment. Thus, not just food security as a welfare objective, but food supplies as a productive input call attention to the present food imbalances between developed and developing countries.

For developing countries, optimal growth will be associated with high rates of employment growth which require greater supplies of food. The capacity of developed countries to ensure those food supplies is a very positive force for economic growth, equity, and food security in the third world. The important factor here is not the concessional terms of such food supplies, but their elastic supply. In most cases, abundant supplies of food aid can do much to accelerate employment growth.

In countries in which a high proportion of employment and income is generated in the rural section, an agriculture-based growth strategy provides the only possibility of broad-based participation by the poor. Many poor people in the third world work in agriculture. Raising their incomes generates a demand for labor-intensive goods and services which are typically produced in the countryside (Mellor and Lele, 1973; Mellor, 1976, see chap. 7). For example, small farmers in Bangladesh and Malaysia spend 35% and 40%, respectively, of their increments to income on locally-produced nonagricultural goods and services. Similarly, in Africa small farmers spend as much as 20% of their increments to income on locally-produced agricultural goods, such as vegetables and livestock (data on Bangladesh from Ahmed and Hossain, 1987; data on Africa and Malaysia from Hazell and Roell, 1984, table 6, pp. 28).

Such incremental expenditure by the peasantry creates demand that facilitates capital widening to a far greater extent than alternative techniques. This places a special emphasis on small farmer agricultural production. If a high concentration of land is held among wealthy farmers, increased profits will go largely to imports or highly capital-intensive goods, and will not induce the necessary multipliers and linkages from agriculture to promote employment in other sectors. Fortunately, the bulk of Asia and Africa have peasant farmer-dominated rural sectors.

This kind of rural-based growth—which provides increased income and employment opportunities to the poor—has two essential components. First, it is technologically based. Agricultural output is stimulated by applying new technology that increases output per unit of input. This is important because agriculture is a sector particularly subject to Ricardian diminishing returns. As attempts are made to stimulate production, the inelastic supply of land causes the productivity of other inputs to gradually decline. It is the rapid growth in real incomes of the farming classes that provides the effective demand for the labor of the poor, partly working to produce the enhanced agricultural output, but far more to produce consumer goods. Note that virtually all programs to increase productivity of the rural poor involve goods for which income elasticities are quite high (Mellor, 1978).

Throughout the third world, the poor spend between 50% and 80% of their increments to income on food (Pinstrup-Andersen, 1985, table 1, p. 9), so food price increases hurt their incomes. The vulnerability of the poor in Asia to rising food prices is well known. It is now clear that the poor in Africa are also generally net purchasers of food and hence, also vulnerable to rising food prices (Lele and Myers, 1987; Reardon et al., 1988). Since increasing food production by incentives such as higher prices hurts the poor, there is a special need for technological change which provides incentives to farmers—incentives which are both potentially greater than those provided by higher prices and which have no negative impact on the poor (Ranade et al., 1988). Cost-reducing technological change is pro-poor, pro-food security.

Second, an agriculture-based development strategy that enhances food security for rural poor requires massive investment in rural infrastructure. It is increasingly clear that reliable all-weather transport is essential to achieving a high level of intensity of farming, labor input per hectare, wage rates, and rate of growth in nonfarm employment. In Bangladesh, Ahmed and Hossain show that good infrastructure compared to poor infrastructure is associated with 92% more fertilizer use per hectare, 4% more labor per hectare in farming, 30% more nonfarm employment, and a 12%

higher wage rate (Ahmed and Hossain, 1987, chps. 4 and 5). Typically, one-third or more of the agricultural area of developing countries is so ill-served with infrastructure as to be left out of these processes (see, for example, Wanmali, forthcoming).

Investment in rural infrastructure must be quite large if agriculture is to become the centerpiece for any development strategy. Unfortunately, many developing countries neglect the countryside and concentrate the bulk of resources in a few major urban centers and in highly capital-intensive industries. This inevitably leads to a very small proportion of the labor force working at high productivity and wage rates, with the bulk of the labor force contributing precious little to the whole development process. Such suboptimal strategies of development are characterized by the import substitution strategies endemic in Latin America, the heavy industry strategy of India and China, and the capital-intensive consumer goods strategy of the Philippines.

Export-led growth typical of South Korea, if fed by massive capital inflows, can bring the mass of people to income levels that provide food security and may eventually pull the rural sector along. But the countries which have done well from the beginning in providing food security are the ones with broad-based agricultural strategies, e.g., Taiwan, Thailand, Malaysia, Kenya, and the Ivory Coast. Such agricultural growth strategies exploit low-income countries' comparative advantage, providing agricultural exports to pay for commercial imports of food as well capital-intensive intermediate products. That strategy varies sharply from one led by exports because initial demand is generated domestically, rather than overseas.

Recent experiences of Kenya and Tanzania illustrate this point. In the 1980s, Kenya's agricultural sector grew at an average annual rate of nearly 3% and was the primary force behind a slightly more rapid growth in gross domestic product (GDP) (World Bank, 1987, table 2). Tanzania, on the other hand, was unable to sustain a rate of growth about 1% for either its agricultural sector or in GDP (World Bank, 1987, table 2). Rapid growth in the incomes of Kenya's poor required large imports of food to sustain per capita consumption. Food imports grew at 6.5% per year in Kenya, compared to only 3% in Tanzania from 1970 to 1985 (Lele, 1988, p. 40). Kenya has been able to provide better food security to its people by promoting more rapid and more equitable growth through an emphasis on its agricultural sector.

REDISTRIBUTION OF FOOD

In a world with large food surpluses in wealthy nations, we should not shy from redistribution of food as a short-run ameliorative to food security. Marginal redistribution of income towards low-income people will not in itself achieve food security. Food, not just finances, is needed. Such redistribution efforts, however, face many problems.

To take a simple case within a developing country, say India, one rupee of purchasing power taken away from a person in the top 5% of the income distribution causes a reduction, in constant prices, of 0.03 rupee in foodgrain consumption (Mellor, 1978, tables 1 and 2, pp. 5-7). That same rupee provided to a person in the bottom 20% of the income distribution provides increased demand for 0.58 rupee of foodgrains. The one-to-one equality of financial transfers is matched by a 19-to-one inequality in material transfers. Thus, a marginal redistribution of income is profoundly inflationary in driving up food prices. In this case, what the left hand of society gives to the poor, the right hand of the market takes away.

Of course, the more prosperous reduce their consumption by the amount of the lost rupee. Most of this reduced consumption will be for labor-intensive goods and services, including vegetables and livestock. This produces reduced employment opportunities—and income—for the poor. The poor lose if the physical supply of food is not increased, either by lower incomes from reduced employment or from higher prices.

The same principles apply to transfers across nations. Financial transfers to poor nations will only serve to drive up the domestic price of food, unless these transfers are used to import food. Keep in mind that the short-run supply response of food production to price is slow and the long-run response is related more to complex institutional development.

All of this means that direct transfer of food to the poor represents a feasible and potentially efficient means of achieving food security by redistributing across international boundaries. But it is important that such food transfers actually reach the poor, or else prices will be depressed. Price decreases, of course, benefit the poor, but there is always the danger that such decreases will retard the process of technological change in agriculture (Mellor, 1978; Mellor, 1968).

The very elastic demand for food by the poor in developing countries offers an opportunity for price discrimination that is advantageous to both food producers and poor consumers. By selling at a lower price in the low-income market, increased consumption occurs that reduces supply in the high-income market

where demand is inelastic, resulting in a higher average price. It should be noted that given the supply schedule it is advantageous to all producers, not just food aid providers in developed countries. That is the theoretical basis for food aid from the point of view of exporters and producers.

Seeing the relationship between food, purchasing power, and food security allows us to understand the place of food security in the current spate of structural adjustment programs, such as those popularized by the World Bank. These adjustment programs are, of course, reactions to unsustainable deficits in government budgets and large trade imbalances. Reducing transfer payments, such as food subsidies, and food imports helps deal with both problems. If subsidies to the poor are reduced, but the supply of food is maintained, then a significant part of the loss from reducing subsidies will be returned through lower prices. There will, of course, be a net loss to the poor, but not in full proportion to the subsidy reduction. The major damage occurs if both the purchasing power of the poor and the supply of food is reduced. Then the reduction in subsidy will not be offset by lower market prices.

Food subsidies and accompanying food imports are likely to represent a substantial part of the budget of those developing countries which have poor agricultural growth records. This is because of the importance of cheap food in maintaining political stability in the face of little income growth. Since the subsidies will tend to drive up prices if imports are not increased, there tends to be a commensurate increase in imports.

Because of the close interaction between incomes of the poor and purchase of food, the structural adjustment process may show itself in many guises, but with the same effect in each case. Policies of reduced government expenditure or tighter monetary policy are both likely to reduce the employment and purchasing power of the poor. This will reduce upward pressures on food prices and thus facilitate reduced imports, thereby closing the circle on food consumption by the poor. Note, that government budget imbalances and trade deficits tend to go hand in hand in the context of food security.

Structural adjustment programs are likely to create another food security problem for the poor. The very purpose of those programs is to accelerate growth. Such growth is likely to raise the incomes and purchasing power of laboring class people in the third through the sixth deciles of the income distribution, who have more human capital in terms of family nutrition, health, and education. As long as the economy is essentially in labor surplus, these people will earn more and put upward pressure on the price of food. If the bottom two deciles remain unemployed and underem-

ployed, they will have their real incomes reduced by the higher prices.

That scenario seems to be precisely what has happened with structural adjustment in Sri Lanka. The top 75% in the income distribution experienced increased incomes and food consumption, despite a drastic reduction in food subsidies; the bottom 20% suffered a lower level of food consumption (Edirisinghe, 1987, table 29, p. 48). Structural adjustment has all the appearances of working, but with a deleterious effect on the very poor, at least in the short run.

Lele argues that similar problems have plagued the process of structural adjustment in Malawi (Lele, 1987). She makes the further point that the pace of market liberalization in the structural adjustment process has often outpaced the capacity to build institutions and to remove constraints for increasing the employment of the poor. In such circumstances, special efforts are needed to ensure the food security of the poor.

In many cases, food aid from the developed countries can be effectively used to mitigate the unfavorable effects of structural adjustment on the poor. Here, the key is targeting such food aid to low-income people. Efficient targeting will maximize market expansion in response to food aid, gratifying producer groups in both developed and developing countries. Thus, the vital questions for food aid in support of structural adjustment are (1) How can it be targeted to the poor? and (2) How can it also contribute positively to the processes of broad-based growth?

The two principal means of targeting food aid to the poor are food-for-work and food subsidies. Food-for-work is usually highly effective at reaching the most poor, because the work is onerous and the pay is low. While food-for-work sometimes misses certain classes of the poor (such as women and the infirm), it is attractive because it helps create the physical infrastructure needed for broad-based growth. In that regard, it is especially attractive in rural areas where, in general, infrastructure is sorely lacking. In much of Africa, for example, the veritable lack of paved roads and complementary institutions presents one of the largest impediments to rural development.

In considering the use of food aid to support creation of such public works, it is well to remember that developing countries are rarely using food as a wage good to back up increased employment. So earmarking foreign assistance in the form of food aid is biasing expenditures and development allocations in a direction which theoretically may not be the most efficient, but it is effective and correct.

If food-for-work is to make an effective contribution to growth it

must be complemented by other resources such as materials for road surfacing and culverts. Ezekiel estimates that in Africa food comprises some 15% to 40% of the cost of public works (Ezekiel, 1988). Ahmed and Hossain show that without the complement of other resources, food aid is of little productive value. In Bangladesh, rural roads without a hard surface are of little value, but paved roads enjoy a high rate of return (Ahmed and Hossain, 1987, chp. 9).

Finding financing to complement food aid in rural public works or other labor-intensive projects is a matter of institutional convenience. One solution is to provide some additional food aid for sale in the market. Such sales must not, however, reduce prices below reasonable levels. A second solution would be to allocate counterpart funds from sales of food aid to such projects to cover nonfood costs (Ezekiel and Gandhi, 1987). A third solution would be to develop institutional ties between developing countries and the institutions which provide financial resources. This solution should be feasible with such multilateral organizations as the World Food Program and the World Bank.

Food subsidies are another means of targeting food towards the poor. They also have a production effect: they should lead to a somewhat more stable and lower-priced labor force. Food subsidies have the effect of distorting consumption patterns towards food—more food is consumed at a given income level when income comes from food subsidies than when it comes in other forms (see, for example, Kumar, 1979; Garcia and Pinstrup-Andersen, 1987). Such distortions may or may not be desirable from the point of view of the poor, but are considered attractive by most donors.

Broad subsidy schemes, the most extreme of which exist in Egypt, have large costs and an immense impact on food security. In recent years, Egypt has spent up to 9% of its national income and 17% of its national budget on food subsidies (Alderman et al., 1982, table 3, p. 16). It has provided in any given year as much as 6.3 million tons of cereal for consumption (Alderman et al., 1982, table 30, p. 74). These subsidies have accounted for about 16% of the total incomes of the poorest quartile of the population (Alderman and von Braun, 1984, p. 41).

Food subsidies may be targeted to the poor by very general measures, such as choosing lower quality foods, or very specifically, by giving the poor food stamps or inviting them to field kitchens. Efforts at narrow targeting are more expensive in poor countries and those with fewer educated people to serve as administrators. It is all too easy for narrow targeting to become less efficient in delivering a given proportion of food to poor people than more generalized subsidies.

A good example of narrow targeting is the pilot scheme in the Philippines, which designated low-income areas and then focused subsidy programs in these areas (Garcia and Pinstrup-Andersen, 1987). Yet in cases like the Philippines, as targeting efforts narrow, they exclude more and more of both the wealthy and the poor. In a sense, efficiency may rise, but deprivation is likely to increase as well.

Bangladesh is a good example of a country using food aid to back both food-for-work and food subsidies. In the mid-1980s, the average value of food aid in Bangladesh equalled 26% of annual development expenditure. That provided a substantial quantity of food and the financial means for the government to transfer purchasing power to the poor. It should be emphasized that governments cannot quickly turn income and food redistribution programs on and off. Once programs are introduced even with foreign aid, governments will do their best to maintain them—even at very high costs to long-term development. For example, an econometric analysis of public development expenditures in Bangladesh indicates that during the period 1976 to 1985, every dollar reduction in the supply of food aid was followed by a reduction in public expenditures on development of as much as 18 cents (Ahmed and Hossain, 1987; Ahmed and Bernard, 1987). Similar analysis for Egypt provides even more striking evidence of the extent to which governments will cut other expenditures in order to maintain food subsidies when foreign aid is reduced.

CONCLUSION

Food surpluses in developed countries can be used as a development tool to accelerate economic growth in developing countries. Food, as a wage good, is an important resource in mobilizing the abundant supplies of labor that are developing countries' comparative advantage. Shortages of food impede an agriculture- and employment-led growth strategy designed to exploit that labor supply.

Food aid from developed countries, as a complement to financial assistance, can be especially important in building the rural infrastructure that is so necessary to ensure the widespread impact of agricultural growth. However, efficient distribution of food aid and its coordination with financial assistance requires a large complex of institutional structures. It also requires a sustained commitment by both donors and recipients to agriculture- and employment-led growth in developing countries. In these days of moral concern about the concurrent existence of food surpluses

and hunger, food aid can bring about an immediate increase in food security.

ADDITIONAL INFORMATION

For a detailed discussion of the impact of agricultural growth on the poor, see Mellor, 1976.

A broad overview of various development strategies can be found in Mellor and Johnson, 1984.

A number of studies analyze the impact of food aid in developing countries. See, for example, Singer et al. (1987), Clay (1985a), Reutlinger (1983), Sen (1983), and Schultz (1980). Maxwell and Singer (1979) review a number of other studies as well.

The concept of food aid as a form of price discrimination is discussed in Mellor (1983) and Srinivasan (1987).

For further analysis of the relationship between food security and the purchasing power of the poor, see Sen (1981). In that context, Mellor and Gavian (1987) and Clay (1985b) analyze the importance of food production in the incomes of the poor.

For additional information on the impact of food subsidies in developing countries, see Ahmed (1979), Gavan and Chandrasekera (1979), George (1979), Gray (1982), Scobie (1983), Trairatvorakul (1984), and von Braun and de Haen (1983).

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FAMINE PREVENTION: LESSONS FROM AFRICAN EXPERIENCE

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Recurrent crop failures and famine conditions in large areas of sub-Saharan Africa have focused unprecedented attention on the nature and causes of famine and the means for their prevention.

Again in 1988 drought-related famine threatens areas of eastern and southern Africa. Ethiopia is especially vulnerable with 6 million people at risk and food relief needs approaching 1 million tons. Almost complete crop failures afflict areas of Botswana, Malawi, Zambia, and Zimbabwe, and several million people are near starvation as a result of civil strife in Angola, Chad, Mozambique, and the Sudan.

This current threat of famine follows closely the great drought emergency in Africa during 1984-85 which is estimated to have taken the lives of over 1 million people, despite the international shipment of about 7 million tons of food aid. This was preceded 10 years earlier by widespread famine in the African Sahel countries and Ethiopia.

The scale of these emergencies, the magnitude of human suffering and starvation they caused, and the degree of economic disruption, social dislocation, and environmental degradation make it imperative to understand the nature of famine. We must learn how to prevent this scourge and, when that is not possible, to better manage emergency relief.

A better knowledge of the nature of famine leads to the conclusion that the means for its prevention is basically a problem of development.

NATURE OF FAMINE

It is now understood that current famine is not necessarily, or even primarily, caused by a physical shortage of food but rather by a loss of assets or income and by the politics that influence their distribution. So people may suffer food deprivation even though food may be available in the market. The problem today is often less one of a physical shortage of food than it is of the inability of isolated

groups to command the means to obtain food (A. K. Sen, 1981).

Even in drought-stricken countries of Africa, food is often available but afflicted groups have lost not only their harvests but entitlements, in assets and income, to assure their food needs. Poverty increases the possibility of such vulnerability.

This situation is in contrast to earlier views that large scale deaths from food deprivation in any region were entirely due to the failure of food production and a breakdown in its distribution. However, with the emergence of an ever-widening economy in transport, communication, and markets, food shortages in one region can more readily be met from the food stocks and surpluses of other regions.

For the first time in human history it is possible to do away with famine. In most of Asia, the combination of increased agricultural productivity and organized food security measures have abolished famine even in the low income countries of China and India. Famine, however, remains a grim prospect for Africa. In drought-prone areas—where crops are subject to fragile climatic conditions—it is professional practice to include measures to minimize the effects of drought as part of development programs. The relative unpreparedness for recent drought in Africa has been called the last area of "unprofessionalism" in the field of development.

It is also true that drought does not cause a sudden disaster in the same way as an earthquake or typhoon. When drought occurs some months pass before a resulting food shortage occurs. These months should usually provide time to reinforce necessary famine prevention measures: initiating emergency employment programs, arranging for procurement and transport of additional food, and raising the financial means required for these activities. Often governments and aid organizations are not sufficiently alerted in advance of impending drought, or when alerted they are slow and inflexible in changing priorities and reallocating resources for drought emergency needs.

Poverty is the Main Cause of Famine

One of the principal lessons of the food emergencies in sub-Saharan Africa is that famine is fundamentally a result of poverty, a poverty which has its roots in severe physical and man-made disadvantages.

Many of the African countries suffer from variable rains, widespread soil deficiencies, and recurrent pest infestations which impose substantial burdens on their farmers. Others have fertile land and rich mineral resources. All, however, are at relatively low

levels of economic development and all are experiencing extremely rapid rates of population growth. Twenty-nine of the African countries qualify by their poverty for the soft loans of the World Bank, and 22 are classified by the United Nations as among the world's least developed nations.

The countries of Africa are highly dependent on a relatively small number of primary commodities for their export earnings. They have therefore been severely affected by the 1980 global recession and the drastic decline in the prices of basic commodities. The resulting foreign exchange shortages have reduced economic growth over the last 5 years to 1% annually, and per capita incomes have declined by 2% annually.

Vast areas of land are being converted to desert as human and animal population increase and humans intensify their search for firewood and for land for grazing or cropping. This impoverishment of the land inevitably impoverishes the people dependent on it.

The relative lack of adequate support for indigenous food production is particularly important. Although largely an agrarian continent, Africa is progressively losing the capacity to feed itself.

Civil Conflicts As A Cause of Famine

Conflicts in a number of the drought-afflicted African countries exacerbate human suffering and compound problems of emergency relief and famine prevention. They often prevent delivery of emergency food to those in need and impair their capacity for recovery and longer term development, particularly in areas of continuing violence.

In such cases, politics occasionally plays a large part in the handling of emergency relief and the allocation of food by governments, both donour and recipient. Increasingly, however, an international standard is emerging in favor of the overriding necessity to put aside food politics in times of famine emergencies.

Emergency life-saving food relief must be above the battle of political and military struggles within and among countries. Here the position of United Nations agencies is clear—humanitarian considerations are primary and must transcend narrower national interests and policies.

Africa's Chronic Food Crisis

Africa's food situation has been deteriorating for over a decade, with agricultural production averaging an increase of 1.7% annually and the rate of population growth at 3.1%. As a result depen-

dence on food imports and food aid has continued to increase. The annual volume of cereal imports almost quadrupled between 1970 and 1982 to over 11 million tons of which 5 million was provided by food aid. Every fifth African depends on imported food, a dependency which is increasing.

The decline in the value of most of the basic commodities on which African countries are dependent for foreign exchange earnings, and a substantial increase in debt service obligations, have severely undermined their capacity to import needed food.

Projections point to the likely persistence of this economic and food crisis well into the 1990s. The downward trend in per capita food production, against a background of stalled development and the concomitant prospects of recurring drought, place sub-Saharan Africa in the historically unique position of being a systemic and long-term emergency. Hence, the importance of integrating measures for famine prevention as part of African recovery and development programs.

MEASURES FOR FAMINE PREVENTION

Economic development to more directly alleviate poverty is the most important way to prevent famine, based on an understanding of entitlement and food shortage issues.

Alleviating Poverty

Previous neglect of rural areas, resulting in inadequate infrastructure investment and in food price policies that favor urban consumers rather than producers, has not only led to inadequate food production in Africa, but to an inequitable distribution of income and large areas of low entitlement to food.

Policies to help the poor realize their productive potential will reduce their vulnerability to famine. These policies should include programs for investment in roads, small-scale irrigation, storage, and market facilities, as well as provision of new varieties of seed, especially sorghum and millet in semiarid areas, and new breeds of small livestock that can tolerate stress from little water. These programs must be implemented in ways which will strengthen the capacity of poor people to better adapt to periodic drought conditions. Measures which strengthen household food security, generate employment, and provide basic health care are especially important.

India provides good examples of programs which aim at asset-transfers and wage employment for the poor. One is the Integrated Rural Development Program which finances, through a combination of loans and subsidies to households under the poverty line, a variety of income earning assets, such as irrigation wells, milk cattle, draft animals, other livestock poultry, carts, and facilities for small-scale occupations in production, trade, and services. Additionally, Indian states seek to provide employment opportunities for the poor on irrigation works, land reclamation, soil conservation, afforestation, rural roads, and small buildings.

Of course, direct measures for increasing the self-reliant capacity of the poor to increase their assets and productive capacity must be within a framework of national policies for food prices and agricultural production, national food reserves, and education and research facilities to provide the human resources for broad-based food and agricultural development.

Building Famine Response Capacities in Existing Programs

Those African countries which are susceptible to recurrent drought should be given special assistance in developing a capacity to anticipate, prepare for, and, as necessary, deal with future droughts to prevent them from leading to famine. This capacity should be integrated into the development efforts of the countries concerned and closely related to programs and organizations for food production, agriculture, conservation, environmental management, provision of basic health, sanitation and social service, and other aspects of rural development.

For example, in famine-prone areas all agricultural and rural development projects should have components that help to alleviate famine and assist survivors. Such components might include tree planting, well digging, and small-scale irrigation.

Techniques that minimize agronomic risk through crop mixes, intercropping, famine reserve crops such as cassava and other interventions to reduce the risk of famine should be stressed. Nutrition education should not only include information on how to improve nutrition but also on how to survive bad years.

Health care and feeding programs, food-for-work, and other employment projects should be planned in such a way that they can readily be expanded in response to emergency situations.

More effective stand-by capabilities also are required—food stocks in strategic locations and the ability to move them. Generally, it should not be necessary to establish large and expensive stand-by capacities. What is needed is the capability to readily obtain food supplies, at least initially in small quantities, to provide

time for assessment of the scale of requirements and of the means for mobilizing them.

In particular, the close relationship between emergency relief, food security, and food policies must be recognized. Development assistance agencies should build into their programs, to a greater degree than in the past, the physical and institutional improvements that will help African societies to better manage recurrent drought. It is unrealistic in drought-prone countries to base programs on "normal year" prospects, since a failure of monsoon rains, in varying degrees, can be expected every third year. This is the basis on which agricultural planning for rain-fed areas is projected in India.

Food Aid Management in the Context of Africa's Food Crisis

Food aid is a versatile resource. It can be used in many ways: income transfer, incentives for community projects, a supplement to government budgets, creation of local currency support funds, balance of payments, price stabilization, food reserves, and emergency relief. How it is used depends on the context of the objectives and policies set for food aid.

Until recently—when many African governments adopted structural adjustment and reform programs—food aid had been important as a means of lowering and stabilizing consumer prices. This action had the effect of lowering producer price incentive and reinforcing consumption changes away from indigenous foods and in favor of imported cereals, notably in urban areas. Food aid used in this policy context dampened investment in agriculture, reinforced urban migration, exacerbated labor shortage in rural areas, and encouraged food aid dependency.

Currently, however, the objective of reform programs is to reverse the trend in declining per capita incomes and food production through stepped-up investment in agriculture. This change in objectives and policy, if it is to be successful, will require several critical changes in the way food aid is programmed and managed, both in terms of emergency assistance and development uses of food aid.

As a development resource, it would be important to program food aid on a multiyear basis and to integrate it with other economic resources in support of sectoral objectives. What African countries need, in the current circumstances, is the assurance of multiyear commitments, similar to the commitments which food aid donors made to India at an earlier and critical transition stage of its agricultural modernization program. That support let the Indian government shift food prices in favor of producers and increase

investment in agriculture while assuring both continuity of supplies and the possibility of supplementing the food needs of low-income consumers.

Despite its clear advantages, multiyear programming for African countries is an issue on which donors have not yet agreed, a fact which highlights related issues flexibility and coordination in donor programming of food aid.

For example, the levels of aggregate food aid among the donors need to be better coordinated and more flexibly adjusted to the changing conditions of individual African countries in order to avoid depressing producer incentives, which happens all too often. At the same time, food aid should be programmed in quantities somewhat below local demand, and for market sales, at a price close to local production costs.

In particular, food aid should no longer be regarded as a separate instrument, but should be recognized as an important economic resource which must be more fully integrated with overall aid packages in support of African structural reform programs. In the resource-scarce situation of African countries, food aid is too important, and too potentially disruptive, to be left outside the development process.

Further, when drought occurs, emergency food aid should aim at saving lives in ways that also address rehabilitation needs; to the maximum extent possible, food aid should not just be handed out, but should support health and education objectives and work programs. Such programs are more likely to be possible and effective when they have been planned in advance of emergency situations.

Children must receive extra protection as their nutritional needs are different from those of adults. And measures for supplementary feeding and health care should be included in relief projects.

Nongovernmental agencies have stressed the importance of actively involving the people directly affected by disasters in development-oriented relief efforts. In exchange for food and other emergency assistance, recipients usefully can participate in distribution efforts, health care, and other relief activities.

India's experience with the management of recurrent droughts has established that communication between government agents and the people in need of relief, through their representatives and voluntary agencies, is important for effective management of advance warning, response, and rehabilitation measures.

Management capabilities are important in the design and implementation of development-related emergency programs, as they are for on-going development projects. Stepped-up manage-

ment training is a clear need, and experience indicates that it is also important to avoid elaborate administrative and institutional arrangements.

Cash-for-work Projects

The concept of famine as a breakdown in access to income or other assets means that in some situations, supplementing income by cash may be more efficient than increasing the availability and direct distribution of food.

The experience with pilot cash relief approaches in the Ethiopian emergency demonstrated that with assurance of a small monthly income, families are able to avoid breaking-up and migrating from their communities to large relief camps. They are able to buy food and also preserve, or purchase, farm tools and seed for the next planting season. This helps families and communities retain their self-reliance and makes the task of later rehabilitation less difficult.

This type of project requires availability of food in the local market and careful planning and management on the ground. The distribution of cash payments is best linked to the entrepreneurial and work skills of the recipients in various work and service programs.

Aid donors are frequently reluctant to directly provide cash for income supplement distribution and find it more acceptable to support such approaches when the cash is raised by food aid sales in the local market.

Early Warning and Nutrition Surveillance

Among the lessons of recent famine emergencies in Africa is the need for improving information and assessment procedures affecting the living standards, health, and nutrition of vulnerable low-income groups.

A much more systematic approach is needed to monitor early warning indicators of worsening nutritional situations which lead potentially into large-scale famine disasters.

Some indicators, such as food prices in local markets, are especially relevant and can be collected routinely. Monitoring systems should be simple and durable so that they can be sustained during noncrisis periods.

Gradually surveillance should be extended to include information on household food security, along with indicators of changes in entitlements, forecasts of crop prospects, overall estimates of

stocks, and projected availability of food at regional and national levels.

CONCLUSION

African countries are now engaged in major programs to reform and restructure their economies. At the same time, emergency food relief will continue to be urgently needed in many African countries. The historic experience in dealing with drought-induced famine emergencies, in both Asia and Africa, has demonstrated the importance of incorporating famine prevention measures into policies and programs for recovery and development, for famine prevention is basically a development problem.

The pressing need is for measures which reduce poverty among vulnerable groups and build-up infrastructure, services, and productive opportunities for people below the poverty line.

Surplus food aid availabilities provide a potential opportunity for African governments to shift away from policies which have encouraged declining per capita food production, rural impoverishment, and growing dependency on imported food. If this potential is to be realized, food aid must be better integrated with other economic resources in support of structural reform objectives. Modernization of agriculture and greater food self-reliance is essential for the sustained over-all development of Africa.

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PART 5

REFINING DEVELOPMENT ASSISTANCE POLICIES AND THRUSTS

WOMEN, DEVELOPMENT, EQUITY, AND EFFICIENCY: IN PURSUIT OF CONSTRAINED BLISS

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Data gathered for the United Nations (UN) Decade for Women have given us a striking picture of the rapid changes in the lives of women all over the world. Women today live longer, have fewer children, are more likely to be literate, to work outside the home, and to have political and legal rights than at any previous time in the world's history. According to UN and national data compiled by Sivard (1985)

- The average girl in the developing world will live 18 years longer than her mother.
- Women in every region of the world except Africa have begun to reduce their fertility. In India, for example, the fertility rate has dropped from 6.5 to 4.8 in less than 20 years; in Indonesia, from 5.5 to 4.3 in 10 years.
- In low income countries, girls' access to education lags behind boys', but is increasing more rapidly. For low income countries the percentage of eligible girls enrolled in primary school rose from 37 in 1960 to 64 in 1977. According to the United Nations Educational, Scientific, and Cultural Organization, in 1984 82% of the world's boys and 71% of the girls of primary school age were enrolled in school. At the secondary level, 45% of the world's students were female; at the third level, 43% of the world's students were female, up from 32% in 1950.
- According to World Bank figures, the number of women in the paid labor force worldwide has nearly doubled since 1950; 46% of the world's women between the ages of 15 and 64 were in the paid labor force in 1985.

These changes in women's lives are occurring in interaction with other transformations in economic, social, and political structures. Two other patterns of change seem particularly relevant to this discussion. The shift from resource-extensive to resource-intensive investments in the next generation, and a shift from traditional to science-based agriculture.

SHIFTS IN INVESTMENTS IN HUMAN CAPITAL

In traditional agricultural societies priority is given to bearing and raising as many children as possible, and to teaching them to perform the same roles as their fathers and mothers. Because infant and child mortality are high, resources of food, health care, parental attention, and education are spread among many children, not all of whom survive to adulthood. During structural transformation, as infant mortality drops and education becomes important for preparing children to live in a world different from their parents', households shift to more resource intensive investments in fewer children. More health care, nutrition, and education is invested in each child. Such shifts occur first in the cities, but in the developing countries, rural areas quickly follow. This shift in fertility, nutrition, and education is now occurring in Asia and Latin America, but is just beginning in urban Africa.

In many systems, boys receive preference for schooling. Girls receive less, both because their labor is less easily replaced and because the returns to the household are less obvious. Nevertheless, the proportion of rural girls receiving an education is steadily rising. As increasing numbers of farm children are sent to school, mothers give more time and attention to young children and often replace the labor of older children in the house and the fields. As children mature, some are prepared for science-based agriculture, others move on to business, government, and industry.

SHIFT FROM TRADITIONAL TO SCIENCE-BASED AGRICULTURE

The shift from traditional to science-based agriculture has been intensively studied and is now reasonably well understood. I will not recapitulate these understandings, but rather comment on what has been, from the viewpoint of women, a serious omission. The process of structural transformation demands that farm households learn to choose and use effectively new seeds, fertilizers, credit sources, land, and labor markets. A great deal of energy has been devoted to analysis of factors that influence those decisions, but gender roles and responsibilities have been ignored as variables. As a result, our understanding of many of these systems has been seriously distorted.

Yet there is a separate stream of research that has produced a deepening understanding of farm women's roles not only as moth-

ers and housekeepers, but as agricultural producers. The earliest literature emphasized women's roles as agricultural laborers, establishing that they were significantly involved as both unpaid family labor and hired labor (Dixon, 1982). Much of this literature focused on the effects of new agricultural technology on the demand for women's labor. Recognition of these effects in turn led to an examination of the returns to women's labor. For unpaid family labor, technologies such as wells and grinding mills which lift the burden of work are undoubtedly helpful, but technologies which reduce or eliminate women's access to paid labor can threaten the livelihood of poor households.

The question of returns to women's labor also highlights questions about the returns to unpaid family labor. If wives are simply laborers, then they are working essentially for room and board. But if they are part of management, then their labor investments entitle them to a degree of control over assets and a share in decision-making. If women are seen simply as workers, they have little claim on government resources such as extension, credit, and improved inputs, but if they are seen as managers or comanagers of agricultural enterprises, their claims on these resources are strengthened. This insight has led to efforts to clarify women's roles in agricultural management.

Where women head households due to death, divorce, or desertion, their roles in management are clear. Large numbers of women also have substantial management responsibility because of male out-migration. Husbands may work off-farm by the day, week, the season, or for years at a time. In particular, migration to the Gulf States during the past decade has greatly increased women's management responsibilities in many sending countries.

In many households, also, women are comanagers of farms with pooled assets and expenditures, with some division of roles and responsibilities and a degree of joint decision-making. This pattern is particularly common in the United States and much of Asia, although the reality is often imperfectly reflected in legal practice and government programs. Pressure is increasing in many countries for coregistration of land title and other capital assets. Such coregistration is growing in the United States, and a number of governments in the developing world are committed to this practice in assigning title for newly irrigated and(or) newly settled land. Such coregistration influences women's access to credit and extension as well as land by clarifying their relationship to the means of production.

Another farm management model is the farm household as a mini-conglomerate, an umbrella for a number of small firms with separate capital and labor streams. The presence of this pattern is

most marked in Africa but is found, often in combination with comanagement, in many parts of the world. In such systems, women and men are responsible for separate on-farm and off-farm enterprises. In some African systems, women are responsible for most subsistence production, while men specialize in cash crops. In other systems, men and women may specialize in different crops: men in cattle, wheat, hybrid maize, cocoa, or oil palm; women in tubers, legumes, swamp rice, goats, poultry, vegetables, fruits, or dairy products. Both men and women are also often active in the informal sector: processing and then selling agricultural products such as beer, baskets, and foods; providing services such as midwifery, healing, laundry, and tailoring; and trading in local and regional markets. In many of these small enterprises, the assets and expenditures are unpooled, although the profits may be used to promote household welfare. It makes sense to deliver resources for such miniconglomerates to the actual entrepreneur, and it is here that women's case for access to agricultural resources is strongest.

Yet the development assistance community has largely ignored the increasing knowledge of rural women's agricultural responsibilities. Both scholars and donor agencies have assumed it away: assumed that farm women are always and everywhere consuming dependents, or at best, homemakers exclusively involved in household production. Reflecting these assumptions they have assisted national governments in building institutions which extend improved technologies, credit, and knowledge only to male farmers. Because these institutions do not adequately address the reality of the systems they are intended to serve, they interfere with the efficiency, as well as the equity, of development efforts.

Gradually, donors are beginning to acknowledge this, and to attend to the efficiency arguments for increasing the flow of resources to women. In 1982 the U.S. Agency for International Development (USAID) issued a Women in Development Policy Paper which emphasized efficiency considerations, arguing that by delivering resources appropriately to both men and women, project performance would be improved.

In 1985, the agency commissioned a major evaluation of USAID's project experience to test this argument. The evaluation covered the first 12 years of USAID's efforts to implement the congressional mandate on integration of women into development, and it was intended to synthesize the lessons learned during implementation as well to test the equity and efficiency of agency efforts. USAID's automated data base of more than 4,000 projects was searched for all projects which mentioned women, gender, or equivalent descriptors.

From this process 416 projects emerged, and a random sample of 98 projects was selected: 43 were agricultural projects, the others were in education, energy, credit/income generation, and water/sanitation; 82% were large integrated projects, the rest were smaller women's projects or women's components of larger projects. Sectoral experts completed desk reviews of all 98 projects, examining the complete paper trail for each project, using a common rating scale to examine relevant project characteristics. Following this review, 10 on-site case studies of current projects were done. Seven of the projects were within the random sample. Three were added to address specific issues.

The evaluation team spent considerable time clarifying definitions. What was really meant by the *integration of women* into USAID projects? The operational definition agreed upon for the evaluation was the delivery of economically productive project resources to women as well as men in a manner that maximizes both equity and efficiency. The objective in implementing USAID's women-in-development policy then becomes the achievement of the highest and most equitably distributed productivity gains attainable with the available resources. This goal is indicated as the point of constrained bliss (McMahon, 1982), which is the point of highest possible combined efficiency and equity on the project's production possibility frontier.

The evaluation then centered on three questions:

1. Did women receive project resources in proportions that maximized both equity and efficiency?
2. What is the relationship between women's access to project resources and the achievement of project goals?
3. What factors in project design and implementation influenced the flow of resources to women?

Answers to the first question were strikingly different between sectors. In some education and credit programs there was an approach to constrained bliss, but in agriculture, with very few exceptions, the projects weren't even close. There were systematic gender distortions in project resource flows. Women received lower levels of resources and received them in fewer projects. Women were noted as active agricultural producers in 38 of the 43 agricultural project documents, yet women were receiving less, much less, of everything. Adding insult to injury, men rather than women were receiving credit and production packages for traditionally female-managed crops such as poultry, groundnuts, sheep, and goats.

For a tabulation of the resource flows in the 22 agricultural projects from West and North Africa and Asia see table 1. In this sample, training was the resource most often targeted to women.

Several projects targeted more than one kind. In four, training was targeted to women's household and human capital roles; in six, to their agricultural roles; and in three, to income-generation in the informal sector. In no case did women receive inappropriate training, but they could have used a great deal more. This situation was true at the level of the farm household, where women needed information on poultry care, improved seed varieties, and a range of production and management information. It was also true at the institutional level, where women received proportionately much less in-country and out-of-country training than men in the same institutions.

The same pattern is evident for technical assistance, with less information flowing to both farm women and professional women. Most projects did not designate technical assistance responsibility to assure that women received resources. When they did provide for paid technical assistance in this area, expatriate personnel were hired locally on a part-time basis. As a result, the technical assistance on women and development was given by the one person on the team who had no institutional support, no ability to draw upon the accumulated experience of the field, and no opportunity to bring lessons learned back into the larger development community. This lack of institutional support for technical assistance on women seriously constrained the efficiency of the resources that were deployed.

Technology flows were also constrained. In three of the five projects in this sample, the technology delivered was primarily for household rather than agricultural production. Most limited of all was women's access to the project's agricultural credit. As some measure of differences in resource levels, in the Niamy Production II, which was probably the most equitably designed and implemented of the projects in this sample, women were targeted to receive US$50,000 in agricultural credit and men were targeted to receive US$12,000,000.

Even the lesser amounts of resources women received did have an effect on the achievement of project goals. Across all sectors, there was a strong statistical correlation ($< .0001$) between women's access to resources (benefits to women) and success in achieving project objectives (see table 2). For agriculture, the correlation was also very strong ($< .001$, see table 3). Casualty runs in both directions. Efficiently designed and managed projects are better able to deliver resources to women, and projects that deliver resources to women are generally more successful projects.

The clearest finding about the factors influencing the flow of resources to women was that gender analysis of the targeted system is important in project planning, but this analysis must be accom-

panied by gender adaptation of delivery systems, institutional arrangements, and technical packages if women are to gain access to project resources. Among the elements that may need to be adapted are the requirements for access to resources such as credit, technology, and training; the location and timing of service delivery; and the gender composition, training, and incentive structures for staff and beneficiaries.

AN AGENDA FOR THE NEXT ADMINISTRATION

Given the difficulty involved, is it worthwhile to try to deliver agricultural resources to women? There are compelling reasons for doing so. The USAID evaluation demonstrated that ignoring women's agricultural roles leads not only to inequity, but to inefficiency, because of the importance of women's management and labor in targeted activities. Increasing women's access to agricultural resources is also an effective way to increase the income of rural families. The research literature is increasingly clear on the connections between women's income, their fertility, and the educational and nutritional status of their children. These, in turn, are directly connected to the larger goals of development, to improving the life chances of people.

Finally, and most importantly, during the last decade an international consensus has emerged that effecting full adult status for women is a major goal of development. Ninety-seven countries have now ratified the International Convention on the Elimination of Discrimination against Women, which in Article 14 (rural women) states the "right to access to credit, loans, marketing facilities, appropriate technology, and equal treatment in land and agrarian reform and resettlement," and the "right to participate in development planning and implementation."

Several donors, including Canada, the Nordic countries, International Fund for Agricultural Development, and United Nations Development Program have begun to move aggressively to implement these rights, and a number of national governments are also moving decisively on this topic. Leadership in international womens rights has moved away from the United States, and if we are to participate meaningfully in this ongoing process, a recommitment of leadership and resources will be necessary.

In concrete terms, what should be done by the next administration to assure that the United States is a major actor in this effort?

First and most importantly, the administrator should make gender equitable access to project resources a clear priority for the

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agency as a whole. To be effective, the policy statement must be accompanied by systematic training of agency personnel to understand the issues and procedures and by clearly stated measures of success and accountability. This strategy has been successfully employed by the Canadians and is now being adopted by other donor agencies. Such efforts provide a reservoir of experience that USAID can draw upon.

Both the agency as a whole and each of the regional bureaus should establish priorities during project design and implementation, based on an understanding of what is both important and technically feasible. Some obvious areas for immediate attention include improving women's access to agricultural credit and to appropriate technical packages. The number of professional women receiving third world country training could and should be increased substantially. Immediate attention also should be given to addressing some of our past mistakes in institution building, strengthening the faculties of schools of home economics and building their capabilities to address women's agricultural roles, as well as strengthening attention to gender roles in agricultural colleges, research, and extension systems. Attention to gender issues in institution building is particularly urgent in Africa, where women bear so much responsibility with so few resources.

Regional bureaus and missions should be given the resources to employ agency personnel and technical consultants with expertise in these areas, and a process should be instituted for tracking the progress of these interventions and synthesizing the lessons learned.

At the same time, longer term research and policy consultation should be initiated on topics which are complex or not understood. African women rights to land in intensifying agricultural systems is a particularly difficult issue which urgently needs research. Clarifying the relationships between rural women's work patterns, fertility rates, and the education of their children is also important, as is a better understanding of the magnitude and effects of rural women's informal sector participation and its effect on household income and expenditures. As work goes forward, other areas of investigation will become apparent.

All these efforts—improved project design and implementation, institution building, research, and training—should be linked not only with the efforts of other donors, but with those of host country institutions. Many African agricultural ministries, such as those in Malawi, Zimbabwe, and Kenya, are actively grappling with the gender equity of their credit and extension systems, and we have much to learn from their experience. A number of institutions in India are working with programs for women in the infor-

mal sector, and governments all over the world are gaining experience with credit schemes for women.

One of the most radical transformations in history is occurring now all over the world. The transformation of women to fully functioning, legally adult members of society. It will continue whether the United States reaches out to understand and assist it or ignores it completely. Yet we have a unique opportunity to aid in understanding the transformation as it occurs, and by understanding, to facilitate it. Such opportunities do not come often. We are fortunate to live at such a time.

A little boldness in the pursuit of constrained bliss is now in order.

Table 1. Gender access to agricultural project resources (n = 22 projects).

	Projects targeting resources		Projects delivering resources	
Training	women 8	men 19	women 5	men 14
Technology	women 4	men 9	women 4	men 7
Credit	women 4	men 10	women 2	men 8
Technical assistance	women 5	men 14	women 5	men 12
Salaries from project (host country personnel)	—	men 22	women 6	men 22

Table 2. Benefits to women as a factor in project success. (All sectors; n = 101 projects, 80 projects with information)

	Success in achieving project objectives			
Benefits to women	High/ likely	Moderate	Low/ unlikely	Total
High/likely	20	2	2	24
Moderate/mixed	10	6	1	17
Low/unlikely	4	11	24	39
Total	34	19	27	80

Source: A. Carloni, 1985. Lessons Learned 1972-1985: The Importance of Gender in AID Projects. Draft, January 1985. p. 25.

Table 3. Benefits to women as a factor in project success. (Agricultural sector; n = 43 projects, 38 with information)

	Success in achieving project objectives			
Benefits to women	High/ likely	Moderate	Low/ unlikely	Total
High/likely	8	0	0	8
Moderate/mixed	5	5	1	11
Low/unlikely	2	8	9	19
Total	15	13	10	38

Source: A. Carloni, 1985. Lessons Learned 1972-1985: The Importance of Gender in AID Projects. Draft, January 1985. p. 33.

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TARGETING DEVELOPMENT ACTIVITIES TOWARD SUSTAINABLE AGRICULTURE

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The paradigm and direction of agricultural development are going through rapid evolution in response to multiple forces. For lack of a better term, *sustainable agriculture* is commonly used to identify the new form and substance of this sector. Defining sustainable agriculture is difficult because agriculture is evolving along different pathways and at different rates in each country. We thus confront multiple moving targets. Development agencies, as a force in this evolutionary process, must be aware of its form and scope and of the actors and methods by which development agendas are determined. Their programs and projects must contribute meaningfully to that development process.

Agricultural evolution is constrained by a host of resource, environmental, and sociopolitical factors. The evolutionary process is little understood, partly because of narrowness of vision on the part of most observers and partly because of the complexity of global interactions and our inability to measure and model them. We describe the process as driven primarily by human value, economics, or technology, depending on our training in the social sciences, economics, or the biological or physical sciences. Most scientists have little understanding of the complexities of the sociopolitical processes that guide public agendas and typically underestimate their importance. Many scientific institutions in the United States are only today beginning to fully appreciate the environmental and public health concerns that achieved agenda status in the 1960s and 1970s.

Our conceptual orientation toward sustainability must have at least three dimensions. First, if we are to be positioned to meet future needs we must be aware of the historical changes in development perspective and be positioned to meet future needs. Second, we must be aware of global, national, and regional interactions between agriculture and the many resource, environmental, and sociopolitical factors that affect them. While we may work locally, we must understand our position in the stream of global development if the methods we use, the institutions we create, and the

technologies we select are to lead to sustainable development. Finally, we must be masters of the technologies we use and the local and regional agricultural systems into which they fit. As we progress from historical narrowness of perception to present-day global awareness and then move to local problem-solving, our perceptions sharpen, our data hardens, and our science becomes more firm. As an institution we must have clear vision at each level.

Perceptions of development needs have changed in the past three decades. In the early 1960s, the combination of new plant genetic technologies, readily available development capital, promising agricultural chemicals, cheap energy, and an underestimation of our ability to affect environmental change caused the agricultural development paradigm to narrow more than at any time in history. The early green revolution approach was once seen as the answer to most of humankind's food and fiber needs. Perhaps because of this narrowness of focus and resource concentration, major gains in production were possible. Development agencies have spent the past 10 to 15 years reacting to resultant deficiencies and problems and to attempts to spread the green revolution to bypassed sectors. Fortunately, the 1980s have brought about a rethinking of the paradigm and a broadening of vision.

DEFINING SUSTAINABLE AGRICULTURE

A workable definition of sustainable agriculture is an agriculture that can evolve indefinitely toward greater human utility (including, for the foreseeable future, increased production), greater productivity (increased efficiency of resource use), and a balance with the environment that is favorable both to humans and to most other species.

This definition is heavily value laden, but it must include a social agenda if it is to reflect the real-life situation of development. It will have the support of a growing segment of the scientific community. More important, it is consistent with the parameters of an emerging social and political agenda for development. But this definition is still generic. To understand the process by which it is translated into substance in less-developed countries, some sense is needed of public agendas, the translation of those agendas into policy, and the roles of agendas and policy development.

A PUBLIC AGENDA FOR AGRICULTURAL DEVELOPMENT

A public agenda is an accumulation of issues that attracts debate and concern. The actors include individuals, social groups, institutions, government agencies, and power brokers. Issues achieve agenda status when they receive widespr ıd continuing recognition. Public agenda items then rece icy status when they receive sanction in the form of law, or other official pronouncement or action. Agricultural i n the development agenda can be grouped into the followi e categories which include examples of frequently heard, specific concerns:

(1) Increasing the utility of agriculture.
- maintaining adequate production
- providing adequate livelihood (considering equity, stability, safety, lifestyle) for desired number of participants
- providing food of acceptable quality and diversity (no pesticides, low heavy metals, little fat, good flavor, little processing, few preservatives, no antibiotics, regulated levels of synthetic hormones)

(2) Increasing productivity.
- developing more-productive biotypes (with pest resistance, tolerance to adverse conditions)
- maintaining soil organic matter, tilth
- maintaining crop diversity
- practicing rotations
- using integrated animal/fish/crop/tree systems
- practicing nutrient cycling

(3) Maintaining an environment favorable to humans and most other species.
- protecting groundwater from contamination
- reducing or eliminating use of pesticides
- reducing use of synthetic fertilizers
- encouraging wildlife maintenance
- recognizing animal rights (reduce stress in confinement, provide for a degree of natural activity)

(4) Assuring the ability to evolve indefinitely.
- minimizing soil loss (from erosion, conversion to nonagricultural use)
- stopping overdraft of fossil groundwater
- reducing energy use (especially of fossil fuels)
- developing better technologies for biological nitrogen fixation
- developing perennial cereals
- maintaining existing genetic diversity

(5) Developing patterns of geographical distribution and scale (macro structure) consistent with national agendas.
- creating adequate physical and institutional infrastructure
- developing market channels that respond to market and social needs
- managing corporate activities that may control portions of the agricultural sector
- monitoring (or managing) land ownership (Land is usually considered to be a quasi-public resource.)

Recognition of these points is given or implied in the definition of sustainable agriculture given in this paper. Most of the five categories are recognized in a current definition by the Technical Advisory Committee (1988):

> Sustainable agriculture should involve the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the natural resource base and avoiding environmental degradation.

USAID, in its most recent iteration (1987), avoids a specific definition but identifies a long list of parameters that fall into the five suggested categories.

The five categories are purposefully broad to include most possible items. In most countries where debate is prevalent, the concerns are remarkably similar to those in the United States. The priorities change with resource base, stage of agricultural development, and national politics. The consistency and speed with which particular items reach policy status depends on the size and influence of the proponent group, the perceived seriousness of the problem, and government responsiveness. Those relationships are largely mysterious, even here in the United States. They are influenced to some extent by prominent events such as pesticide spills, farm bankruptcies, or major disasters.

Development planners must be sensitive to the processes by which public agendas are determined and translated into social or political action in the countries in which we plan to work. An outstanding example of such sensitivity is the evolution of the small, Winrock International-assisted project in the Bicol region of the Philippines. Originally designed as a research project, the focus was shifted (with Winrock's encouragement) toward adaptive research and production in 1986 as the Marcos government began to look toward short-term goals and as social unrest in the Bicol began to disrupt other programs. Intermediate-term goals were maintained as staff members were trained and the regional institution was strengthened. The focus was exclusively (and very visibly) on improving family income on small farms, which comprise over

90% of the farms of the region. The project staff organized groups for field testing and information sharing and developed small enterprises to generate cash flow when needed for purchasing inputs, thus providing greater independence from the agroindustrial complex. Choices of alternative crop and livestock technologies were left largely up to farmers. Low-input technologies were included.

The project is well tailored to the social and political agendas of all parties in the area and operates freely and effectively in the six Bicol provinces that are among the least stable in the Philippines. Several of the sites, in fact, are under the control of peasant groups that are not loyal to the Manila government, yet it has the blessings of all groups. It meets Winrock's mandate for long-term impact through training, institution building, and stabilization of the soil and water. It is important for all projects to fit development needs at the national and international levels as Winrock's project does in the Bicol region.

SECTOR DISTINCTIONS IN AGRICULTURAL EVOLUTION

The development paradigm of the 1960s was created by extrapolating the U.S. trends of the time. We expected farms to become fewer, larger, and more specialized, farm labor to be replaced by mechanization, pesticides and fertilizers to make all soils highly productive, and well-developed rural infrastructure to facilitate the flow of materials and services.

This model is no longer adequate in the United States and never has been for most less-developed countries. Agriculture in most developing countries has three sectors, each with its own characteristics, evolutionary pathways, and sustainability factors: industrial agriculture, small-scale commercial agriculture, and limited-resource agriculture. In most countries, an industrial agriculture sector is characterized by higher capital investment, more modern technology, and usually a larger scale than is found in the rest of the nation's agriculture. Production enterprises are those that receive great benefits from economies of scale, product quality, or high technology. Poultry and swine, being highly responsive to scientifically determined rations and high-technology quarantine and health care, have major economic advantages in vertical integration and in industrialization (large-scale, capital-intensive, even corporate ownership). These animal-production segments are rapidly entering the industrial sector in India, Thailand, the Philippines,

and other Asian countries. The resulting efficiencies of production practically eliminate small-scale competition. This trend has obvious tradeoffs, mostly considered by development specialists to be favorable. One social benefit of industrialization is the reduced need for the public sector to generate and transfer technology as the private sector takes over these functions.

Fruit for export, such as bananas or pineapples, and many processed vegetables and fruit offer similar opportunites for industrialization. There is little advantage in industrializing feed and food grains in most developing countries. In industrial agriculture, technology almost always comes from the private sector, so few opportunities exist to influence it. Factors in the sustainability of industrial agriculture are economic and environmental. Where large numbers of animals are maintained on small parcels of land, nutrient concentration (from manure) can be a major problem; guidelines must be established and followed for geographical distribution of production. (We presently have no such guidelines in the United States.) Pesticide use is often cited as a major environmental problem for this sector, contaminating water, killing fish, and causing human health problems.

A major area of opportunity is the interaction between the industrial and small-scale commercial sectors. A broad range of small-scale, complementary enterprises can and should be located near these industrial operations to make more efficient use of nutrient and energy flows and by-products and to provide goods and services. (We do not, as yet, take full advantage of these opportunities in the United States.)

In the second sector, small-scale commercial agriculture, soil and water resources provide moderate to good production potential. This sector provides most of the crop products for domestic use and export in developing countries. It is the area on which green revolution technologies have had the greatest impact. The agricultural research centers that are part of the Consultative Group for International Agricultural Research had their initial impacts here. Their present mandates are to maintain and increase small-scale production and to broaden its scope by developing varieties and other technologies adapted to more adverse soil and water conditions. By expanding irrigation, this high-resource area is increased, but costs are rising as efforts are extended to the less well-endowed areas.

Sustainability concerns for small-scale commercial agriculture also are economic and environmental. The efficiencies of crop integration are extremely important. It is in this sector, however, that the environmental impacts of soil nutrients and pesticides are most urgent.

Several general requirements for sustainability of small farms transcend state and national boundaries:

- Small farmers must have off-farm income, produce at least some high-value products, or have secondary-processing enterprises if they are to elevate their lifestyles above subsistence. Increasing production of food, feed grains, or raw products for industry does not markedly increase small-farm income.
- Small farms need diversity of enterprises for economic and biological stability and for efficient use of production resources.
- Crop diversity and rotation are essential to control pests, reduce downward movement of nutrients in soil, biologically fix nitrogen in the soil, and make full use of the growing season. If properly arranged, rotations reduce energy input per unit of output by 50% to 60%.
- Crop diversity and rotation are most effective when livestock are on or near the farm, creating a market for quality livestock feed.
- Small farmers, much more than large farmers, need farm services and diverse market channels available locally.

Thus, production-system characteristics for long-term sustainability can be summarized as follows:

- Pest and weed control must be built into the systems, not dependent on outside intervention.
- Nutrient cycles must, as much as possible, be closed.
- Production must be diversified at the farm level.

The third sector is limited-resource agriculture, which is common in areas where large numbers of people are concentrated, severely overloading the environment. Soil quality is low and water is less available. Incomes are low in these areas, and social and political problems often are rampant. These areas and people have been bypassed, so far, by development. Managing access to lands held in common has extremely difficult social and political dimensions. The cost of physical and institutional infrastructure is high in these areas, and short-term economic returns to investment in infrastructure often are low.

Technologies must focus on high-value crop and animal products if the sector is to evolve toward a market economy. Food and feed grains can be produced by this sector only in the short run and only for subsistence; grains have no long-run role in limited-resource agriculture. Perennial fruit, spices, and other high-value crops are well suited. The greatest potential, however, is for improving livestock by improving pasture and fodder production. Agroforestry seems to have a significant role in increasing productivity in this sector.

In both high- and low-resource-base sectors, the numbers of people are unlikely to decline for the next several decades in most of the countries in which we work. Projections for India are that the numbers of people in the agricultural sector will increase dramatically for the next several decades, leveling off somewhere around the year 2040. A focus on incomes would be well placed.

SUMMARY

The definition we are using for sustainable agriculture covers the five characteristics of a sustainable system: its public utility, productivity, environmental balance, structure, and ability to evolve indefinitely. The public agenda for sustainable agriculture is an expansion of these five dimensions. To be effective, development agencies must be sensitive to the public agenda of each country and understand its relationship to policy and to the agricultural development process.

The assumption that underlies the focus on sustainability is that, agricultural products will remain undervalued and the true costs will be paid by future generations, unless we deal with the social and environmental concerns and costs. As we move toward increasing interaction on a global scale, underpricing agricultural products by not factoring in social and environmental costs exploits farmers and environments on both ends of the market channel. Short-run gains are made at enormous future costs. Unfortunately for densely populated countries, often a major portion of that cost is human misery.

A second and brighter assumption, however, is that if issues of sustainability are dealt with early in the evolutionary process, corrections to structure and technology are far easier and less expensive than if action is delayed.

Ultimately, development inputs must focus on key aspects of institution building, technology generation and transfer, and problem solving. It is the selection of those targets and the way that they are approached that will determine whether resulting evolutionary change is sustainable.

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THE URGENCY OF INSTITUTIONAL CHANGES FOR AGRICULTURE IN LESS-DEVELOPED COUNTRIES, NEWLY INDUSTRIALIZED COUNTRIES, AND DEVELOPED COUNTRIES

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Four driving forces for development are technical, institutional, and human improvements and growth in the stocks of physical and biological capital. All four are individually essential; any one, two or even three are insufficient. Despite efforts of prominent economists to estimate separate returns to efforts to improve each of these four forces individually, their complementarity precludes reliable estimation of their separate contributions to development. When one of the four forces is deficient, empirical workers find what appears to be great returns to providing the missing one since that permits unused stocks of the other three to be used to contribute to the apparent productivity of the missing one. When there are no unused stocks of one, two or even three of the four forces, the provision of additional amounts of the fourth fails to generate more agricultural development since development is already constrained by one or more of the other three. This concept can be verified by examining the cases of oil palm technology in Nigeria and Malaysia, the minimal impacts of capital loans and grants in Africa and South America, public administration institutes and projects in Africa, and numerous human development projects in Latin America and Africa.

It is the thesis of this paper that institutional limitations are presently the most serious constraining factor for the agricultures of developed and newly industrialized countries. Present stocks of technologies and of biological and physical capital are more than adequate in these countries. So too are their stocks of human capital. Less developed countries on the other hand typically lack all four but are now constrained more by existing institutions and human capital stocks than by technologies and stocks of biological and physical capital. In this paper, I stress institutional constraints. It should be noted, however, that a particularly strong case can be made for attention in the less developed countries to human capital

constraints by social scientists. There is also a strong case for overcoming biological and physical capital limitations in less developed countries though the self generation and utilization of such capital is often constrained by institutional deficiencies to which attention must first be given.

This paper is organized as follows: first, the transaction costs/institutional approach to businesses and institutional history; second, the transaction cost/institutional analysis used to interpret what has and is happening to agricultural institutions around the world; third, conclusions and speculations about changes in agricultural institutions including opportunities to research such changes.

TRANSACTION COSTS/INSTITUTIONAL ANALYSIS OF CHANGE

The institutional constraints on agriculture considered in my opening remarks are crucially important in the affairs of all agricultures. These institutional deficiencies cry out for research to permit us to promote adjustment and development and to see and better understand the future of our agricultures. General economists and economic historians are now making considerable progress on what they term the transaction costs/institutional (TC/I) approach to institutional change. This approach has potential for helping us interpret, understand, overcome, and adjust to the institutional constraints.

Important names in development of the TC/I approach include O. E. Williamson (1985), Douglass North (1981), William Baumol (1986), and Allen Buchanan (1985). Williamson and Baumol work as economists, North as an economic historian, and Buchanan as an economic philosopher. (My own acquaintance with this literature is too recent and meager for me to be confident I have mastered it and am not neglecting important contributors.) Writers in this area describe their work as being in its infancy. They are continually culling, extending, and otherwise modifying their approach. Baumol (1986) feels that Williamson unduly differentiates the TC/I approach from the neoclassical, market adjustment approach of economists to markets conceived broadly to include political processes in such a way as to accommodate the induced institutional change hypothesis of Ruttan (1971) and others. I tend to agree with Baumol about the differentiation but believe that the TC/I analysis can materially improve the induced institutional change hypothesis.

In *The Economic Institutions of Capitalism*, Williamson (1985) examines how firms act and create institutional arrangements to obtain the benefits of progress while minimizing the costs of errors arising from imperfect knowledge and transaction costs. According to Williamson, transaction costs place firms in danger of making costly mistakes in the presence of asset specificity—I would use the term *asset fixity* (G. Johnson, 1958; Edwards, 1959; Johnson and Quance, 1972)—imperfect knowledge, and malevolent exploiters waiting for an opportunity to take advantage of those making mistakes. In the absence of these conditions, the market mechanism (including contractual arrangements) is viewed by Williamson as capable of adequately governing the economic activities of society. In their presence, transaction costs make it necessary for businesses to develop institutional arrangements to help control transaction costs and their impacts, and market failures are to be expected. Many institutions of capitalism reduce losses (both public and private) associated with transaction costs, imperfect knowledge, and asset specificity.

Though Williamson views transaction costs mainly from the standpoint of management as the governance unit of a business or corporation, they can also be viewed from the standpoints of parastatal or socialized enterprises. He asserts, in general agreement with Knight (1941), that without transaction costs, imperfect knowledge, and the possibility of consequent errors, a business is merely a producing unit—a production function if you please—devoid of management and managerial processes and adjustments and the need for institutional arrangements to manage transaction costs. In Williamson's analyses, transaction costs become important when a business uses specialized assets in which investments can be mistakenly sunk (because of imperfect knowledge) under circumstances that offer others an opportunity to take advantage of mistakes at the expense of the management unit making the mistake. Imperfections in knowledge arise in part from inappropriate perceptions of physical, political, social, and other realities, some of which may be ideological in nature.

Williamson's analysis helps explain why imperfectly informed businesses (and socialized farm production units) create institutional arrangements within and among themselves to alleviate the adverse effects of the transaction costs they encounter in organizing production to acquire the gains made possible by better technologies and other improvements. It also helps explain why farmers organize themselves relative to government to induce governments to make institutional arrangements to alleviate the adverse effects of transaction costs (D. Gale Johnson, 1947).

There are transaction costs involved in changing the internal institutional structure of a production unit. In the presence of such costs, institutional arrangements also become incorrectly fixed because of errors originating in imperfect knowledge of management. The Williamson analyses show how management units, including those of farms, seek the gains of development by devising institutions to control transaction costs as the sum of assembly (or installation) and dismantling costs, and the adverse consequences of making mistakes.

The transaction costs involved when a farm acquires or disposes of specialized productive assets such as land, machinery, and livestock establish a differential between what I call the replacement or acquisition cost and the salvage value of an asset (Johnson, 1958; Edwards, 1959; Johnson and Quance, 1972). It should be noted and emphasized that in market controlled economies, competitive farm firms invest in highly specialized and durable assets in unstable, almost unknowable, changing environments surrounded by a competitive market that opportunistically but not malevolently takes advantage of the investment mistakes of farmers. It is also noted that the managers of socialist farm units and agricultural systems, like their counterparts in privately managed agricultural sectors, encounter transaction costs in using specialized agricultural inputs. They, too, often erroneously sink large investments in specialized inputs because their knowledge is also imperfect under circumstances that give others in their bureaucracies an opportunity to take advantage of their mistakes.

In his book entitled *Structure and Change in Economic History* (1981), North stresses the cost of changing institutions in interpreting history. A rather concise summary of his argument is found in the *Journal of Economics History* (North, 1984) entitled "Government and the Cost of Exchange in History." In a still more recent article entitled "Institutions, Transaction Costs, and Economic Growth," North (1987) points out that economists commonly ignore transaction costs and imperfect knowledge. The extensive use of this approach by economic historians in the years before 1984 led them to neglect the institutions society develops to handle transaction costs. North argues that economic historians must now use the TC/I approach in interpreting history to go beyond the economic analyses commonly taught to undergraduate and graduate students and used by economists.

Whether North's criticisms apply to the analyses of all economists is not particularly relevant here as it certainly applies to the work of many. I have pointed out long ago and elsewhere that many economic analysts ignore acquisition cost/salvage price differentials for investing and disinvesting in durable productive assets (John-

son, 1958; Johnson and Quance, 1972). These differentials are determined by transaction costs. In my analysis, such differentials combine with imperfect knowledge to help explain asset fixity, changes in length of run, irreversibilities in supply and input demand functions, opportunity costs, private and social losses on sunk costs, and the like.

North is concerned with changes in public institutions. He argues that four variables must be taken into account in understanding institutional change and lack thereof. The four variables are:

- the cost of measuring the goods and services exchanged and the performances of persons and agencies
- the nature of the exchange process, that is, whether it is personal or impersonal
- enforcement of agreements in order to avoid cheating, opportunism and shirking
- ideological attitudes and irrationality

North's list is related to Williamson's list that includes asset specificity, imperfect knowledge, and opportunism.

Both public and private institutions to control transaction costs are put in place at a cost and, in turn, can generally be dismantled only at a cost. In this sense institutions are like tractors, irrigation systems, breeding herds, and orchards. Governments and businesses incur transaction costs in establishing and dismantling institutions much as firms encounter transaction costs when investing and disinvesting in lumpy durable factors of production. Institutions are both informal and formal, the former being illustrated by credit ratings among business people well known to each other and the latter by the acreage diversion program of the USDA. Transaction costs are involved for both kinds of institutions. For the remainder of this paper, I shall refer to the costs of establishing and dismantling both kinds of institutions as *institutional transaction costs* and to the costs of putting durable productive assets in place and of dismantling them as *production transaction costs*. This terminology goes beyond that of North and Williamson to provide us with words to describe more adequately the institutional and investment constraints facing agriculture around the world.

At this point in the discussion, economists may argue that all that is required to explain institutional changes is to broaden the usual concept of markets to include political "markets" that include the "induced institutional change hypothesis." North would object, however, as such explanations leave out institutional transaction costs and the roles that imperfect knowledge, irrationality, mistaken choices, ideological commitments, and opportunistic use

of political, military, and other kinds of power play in forming governmental institutions (North, 1981). He argues that "political systems have an inherent tendency to produce" institutions involving "inefficient property rights or decline" (North, 1981). By contrast the induced institutional change hypothesis can generate only correct improvements when transaction costs are treated as zero and knowledge is regarded as perfect (Ruttan, 1971; Ruttan and Haymi, 1984). In North's analysis transaction costs and imperfect knowledge lead to the establishment of mistaken institutions. Thus, North's analysis provides a much better explanation of how the present mistaken price support, subsidy, and import protection institutions of Japanese, Western European, North American, Korean, and Taiwanese agricultures came about. North's analysis is also useful in understanding the roles past mistakes have played in creating the agricultural institutions of mainland Chinese, the Soviet Union Eastern European socialist countries, Tanzania, and Cuba (Csaki, Boyev, Li, symposium papers). It also helps us understand the difficulties encountered in overcoming the institutional shortcomings of less developed African, Latin American, and Asian countries. It should be noted that economists commonly ignore the gains and losses of investments mistakenly sunk in durable biological and physical capital.

North and Williamson make a valid point in calling our attention to how dangerous it is for historians (and economists) to disregard transaction costs, imperfect knowledge, irrationality, ideology, and power in analyzing institutions, and the value of the TC/I approach in studying history.

INSIGHTS FROM TC/I ANALYSES OF AGRICULTURE INSTITUTIONS

In this section I draw heavily on two recent conferences: one in Beijing in November 1987 on Rural Development Strategies, sponsored by the International Association of Agricultural Economists (IAAE) and the Chinese Society of Agricultural Economists (CSAE), and another in Taipei in January 1988 on directions and strategies in the Asian Pacific region. Over 50 papers were presented at the first and 26 at the second. Both conferences placed heavy stress on institutions and institutional changes. I also draw on my own U.S. (Johnson and Quance, 1972), Nigerian (Johnson et al., 1969) and Korean (Rossmiller et al., 1972) studies as well as studies on growth and equity that were summarized at the Jakarta Conference of the IAAE (Johnson, 1983).

Institutional transaction costs, both when high and low, have been important for the agricultural decision-makers of mainland China and the newly industrialized Asian countries. High institutional transaction costs (including those of a civil war) were paid by mainland China to change land tenure institutions and redistribute the ownership of land from feudal landlords to peasants. Transaction costs short of war were also incurred in reforming the land tenure institutions of Taiwan, South Korea, and, earlier, Japan. Further, large institutional transaction costs were incurred in dismantling the original land reform of socialist China so as to reconcentrate land ownership in the hands of the state under the control of the Communist Party of China. Subsequently, in the late seventies both institutional and production transaction costs were incurred in dismantling a substantial part of the state farms and communes as production institutions in order to pass control, if not ownership, of land back to individuals and families under the responsibility system. Investments in both biological and physical capital in the agriculture of socialist China were low during the cultural revolution—so were earnings on these investments. Consequently, the dismantling and disposal of production durables done at the end of the cultural revolution did not involve much loss of productive value. This helps explain the exceptional volatility of China's agricultural institutions since the end of the cultural revolution. In post-1978 socialist China, agricultural reforms have been and are being sought to alleviate difficulties related to North's four variables: performance measurement, exchange processes, enforcement of agreements, and ideologies and irrationality.

I turn now to Japan, South Korea, and Taiwan. Their institutions have long been favorable for agricultural production. South Korea has now found that earlier land reform institutions so fragmented land ownership and control that farmers do not have units large enough to produce incomes comparable to those being received by industrial workers. Thus, like socialist China, South Korea is now encountering the institutional transaction costs involved in partially dismantling earlier land reform. Japan and Taiwan are also encountering dismantling costs in partially changing their land tenure institutions. More fundamentally all three attained high degrees of food self-sufficiency and security by heavily subsidizing their agricultures and(or) granting them high and tight import protection.

In agreement with Williamson, I have argued and presented supporting empirical work elsewhere (Johnson, 1958; Johnson and Quance, 1972) that asset specificity and imperfect knowledge of continuous change (technical, institutional, and human) create problems for farm entrepreneurs involving the transaction costs

that make up the differences between acquisition costs and salvage values of assets. Though Williamson is not very explicit about it, sunk costs become problems only when they are in overcommitted resources whose earnings do not cover the transaction costs involved in acquiring them. Nor is he explicit about opportunity user costs that are part of the economics of extracting service flows from fixed durables (J. M. Keynes, 1936; A. Lewis, 1949; Baquet, 1978; Robison and Abkin, 1981). Services from sunk assets earn opportunity costs or shadow prices insufficient to cover original stock acquisition prices. The uses of the services of sunk assets are governed by current shadow or opportunity cost and, sometimes, salvage values (or off-farm opportunity costs); however, capital loss, cash flow, leverage, and bankruptcy problems are created by historical acquisition costs of fixed or sunk assets. It is easy to demonstrate, both theoretically and empirically (Edwards, 1959, 1985; Johnson and Quance, 1972), that random mistakes made as a result of imperfect knowledge when investing in specific assets with transaction costs for acquisition and disposal generate a tendency to outproduce effective demand even in the absence of price supports and input subsidies.

Since World War I, U.S. agriculture has outproduced effective demand in all but about 8 years in the sense of producing so much that market prices did not cover acquisition costs of investments and expenditures. About 13 of the 52 years of overproduction were before the present series of production controls and price support programs was established. Those who correctly blame much of our overproduction on price support and subsidy programs should remember that we overproduced before these programs existed, and that overproduction currently typifies many farm commodities for which such programs do not exist (Johnson, 1985). The original need was (and the continuing need still is) for programs to help farmers handle transaction costs and the investment mistakes they inevitably make because they are not perfectly informed. What they need is institutional arrangements to do this that do not oversupport and oversubsidize, and hence, add to overproduction problems. With supports and subsidies, it is again easy to demonstrate (both theoretically and empirically) that entrepreneurs tend to overprice land, overinvest in nonland capital, overcommit labor, and overproduce the effective demand inherent in the price support and subsidy institutions. Whether or not Taiwan, South Korea, and Japan are importers, self-sufficient, or exporters of food and feed grains, their farmers should be expected to overinvest in agricultural production durables, overprice land, and overproduce the effective demand they face within their subsidized and protected systems and relative to international demands.

The subsidies and assistance given to South Korean and Taiwanese agriculture by their respective agricultural institutions are less extensive and less expensive than those for Japan. Japan's agriculture is probably more heavily subsidized and protected than the agriculture of any other developed country (USDA, 1987). It is followed by the European Economic Community countries. In North America, subsidies for farm products are not as high as in Western Europe. However, they are high enough to have created surpluses and raised governmental costs to levels increasingly questioned by U.S. taxpayers. Apparently subsidies for Canadian farmers roughly comparable to those for U.S. farmers are less obvious to Canadian than U.S. taxpayers and consumers in part because the Canadian costs are paid from provincial as well as federal treasuries. The agricultural products of Oceania are probably less subsidized and protected than those for any developed country (USDA, 1987). One cannot examine the institutions of the developed countries and newly industrialized Asian countries acknowledging the realism of North's concern about irrationality and mistaken institutions. Many of the North American production control and price supports were originally designed to stabilize production prices and income so as to protect farmers against losses arising from imperfect knowledge and transaction costs. However, North American farmers and politicians went beyond the need for such protection to price support and subsidy levels that were unjustified on these grounds, much as their Western European, Japanese, and newly industrialized Asian counterparts went to price support and subsidy levels and import restrictions unjustifiable in terms of food security goals.

The agricultures of the developed Western nonsocialist countries now have mistaken institutions for subsidizing and protecting agriculture that were put in place at substantial institutional transaction costs. Included in the costs of establishing these institutions are the costs associated with increases and decreases in the value of farmland (Lowenberg-DeBoer, 1987; Boyne, 1964) and production quotas and overinvestments in other assets. If and when such institutions are dismantled in response to taxpayer and consumer dissatisfaction, high dismantlement costs will be incurred. These costs will be both private and societal in nature. Such costs will be better understood if they are researched by rural sociologists, rural political scientists, rural anthropologists, and agricultural geographers as well as agricultural economists. Included in dismantlement costs will be the destruction of property values based on the price support, production control, and import protection institutions now in place (Lowenberg-DeBoer, 1986). But this is not the end of the matter. Foreign exchange control and related institutions

that protect nonfarm producers and laborers are also in place especially in newly industrialized Asian countries, Japan, and Western Europe, some of which involve governmental deficits and foreign exchange regulation. Deficit financing and exchange controls inflate prices, distort price relationships, and redistribute property values particularly in less developed and newly industrialized countries.

At the recent joint conference of IAAE and CSAE economists, Li Renfeng (symposium paper) of the Institute of Soviet and East European Studies of the Chinese Academy of Social Sciences presented an interesting paper entitled "Problems of Rural Reform in the Soviet Union and Eastern Europe." Li's paper stressed the early dominant role of Soviet agricultural development thought in organizing agricultural production in socialist Eastern Europe as well as in the Soviet Union itself. Li summed up the main defects of the earlier Soviet approach.

- implementing socialist planned management in an "absolute" way using standard planning indexes to create a plan with the "effect of law" for implementation by all production organizations
- ignoring the "active role of commodity production" as if the Marx/Engles assumption that commodity production had disappeared were true when, in fact, it is not
- disregard of benefits for farmers and the need for a certain amount of equality in the distribution of income between farmers and nonfarmers in order to motivate farmers, farm laborers, and the managers of agricultural production enterprises

Li indicates that the USSR and Eastern Europe started reforming their agricultural systems away from the original Soviet pattern in the mid-1950s. These reforms reduced the compulsory use of planning indices and granted more power to local decision-makers particularly at enterprise levels, reduced use of compulsory selling systems, raised purchase prices for farm products, reorganized machinery and tractor stations and enterprises for producing farm inputs, and partially shook off rural collectivization in favor of rural cooperatives. Li indicated that agricultures of the USSR and Eastern socialized countries still remain the "weak point in their economies." He did not consider institutional dismantlement costs and sunk production investments as possible explanations of the slow pace of reform in agricultural institutions of Eastern Europe and the Soviet Union but, then, he did not have access to Williamson and North's transaction cost analyses of institutional change.

The TC/I approach is useful in understanding the slowness of rural institutional reforms of the Soviet Union and in the socialist Eastern European countries. Those reforms are encountering considerable resistance from those who want to keep agriculture the

weak point in the economies of these countries. Such resistance should not be surprising. In these countries, agricultural institutions and systems have been moderately stable and passably workable for a long while. People have found niches where they collect benefits (rents) that increase with development and specialization. Even urban consumers benefit from low food prices if not from high quality, diversity, and quantity. Further, powerful party members and military leaders are conservative Marxists who fear that institutional change may deprive them of power and other benefits. In Poland, both agricultural and nonagricultural reforms have been staunchly resisted by the party and government.

In Hungary, reforms in rural institutions came easier. Csaba Csaki, rector of Karl Marx University of Economics, Budapest, presented a paper at the same conference showing the adaptive conservation of Hungarian agricultural planners as they made their agricultural reforms. Hungary did not abandon state and cooperative farms, but became more flexible and adaptive regarding them. Hungary's institutional reforms transferred to the managers of state and cooperative farms much decision-making power and operational control that had previously been exercised from Budapest. Further, farm product prices and rewards for work and accomplishments were increased and placed under local control. Some land is owned by cooperatives and some by their members. Though the Hungarian government continues to place heavy reliance on large-scale production units operated as state farms or cooperatives, Csaki reports that half a million plots and small farms are under cultivation. He does not attribute the diversity of Hungary's agricultural production organizations to the supremacy of small-scale farming. Instead, he notes that the large-scale state and cooperative enterprises produce most of the grain, sugar beets, sunflowers, and green forages. On the other hand, smallholder operations are important for vegetables, fruit, and wine. Livestock production is distributed among both large- and small-scale units with the small-scale producers being relatively more important for pork, eggs, and rabbit meat.

Even the large-scale farms of Hungary are regarded as dependent on technical assistance. They are served by institutions known as Technically Organized Production Systems. In turn, the large farms provide technical assistance to the smaller ones. Csaki reports that Hungary is developing a large number of intermediate organizational structures including a wide variety of joint ventures. Some of the joint ventures are cooperatives and some are legally and financially independent enterprises. Joint ventures provide construction, food processing, marketing, and other services to the farm as well as the nonfarm sector.

Hungarian agriculture is more outward oriented than that of most socialist states and resembles South Korea and Taiwan in that respect. A high proportion of Hungarian land is cultivatable. Because it has virtually no other renewable natural resource to use in earning foreign exchange, Hungary must use land to earn foreign exchange from both within and outside socialist countries. Csaki characterized Hungary's agricultural institutional reforms as based on "voluntary gradualness" on the part of decision-making units, granting much independence from central control to local decision-making units, recognizing a national financial interest in the productivity of agriculture, stressing socialist democracy, and requiring substantial state support for Hungarian agriculture.

Hungarian policymakers

- rely on Hungary's agricultural and food industry to meet all of the increasing demands of its citizens for the products its agricultural system can produce
- regard socialist, large-scale enterprises to be the basis for increases in production and the pillars of the Hungarian agricultural system
- rely heavily on agriculture in achieving the socioeconomic and financial possibilities of the country
- regard small-scale agriculture as an integral part of Hungarian agriculture
- stress the nonagricultural and service activities of its agricultural enterprises
- encourage a multiplicity of diverse enterprise types within agriculture
- rely heavily on the independence of enterprise managers pursuing their unit's financial material interest to replace earlier, more centralized management procedures and institutions.

The reforms of Hungarian agriculture seem to have rather carefully taken into account institutional and production establishment and dismantlement costs and have done so in a manner that has avoided many potential institutional mistakes for Hungarian agriculture.

V. R. Boyev, director of the All Union Scientific Research Institute of Agricultural Economics, presented a paper entitled "The Strategy of Development of Agro Industrial Complexes in the USSR" (symposium paper).

Boyev's brief written paper contained little in the way of specific references to reforms in Soviet agriculture. "The general task in agricultural development and development of agroindustrial complexes is to concentrate production in places with the most favorable and natural economic conditions and to carry out a socioeconomic policy which can be regarded as fundamental prin-

ciples for development of agroindustrial complexes," Boyev said. This statement implies that managerial forms and production organizations must be flexible. In his ad hoc public remarks at the Beijing symposium, however, Boyev placed much greater emphasis on the reforms he described as now being put in effect for Soviet agriculture. He placed even greater emphasis on the importance of successfully carrying out Gorbachev's view of how to manage the Soviet economy in general and its agricultural sector in particular. He also recognized implicitly the high transaction costs and dangers of making institutional mistakes in carrying out these reforms.

Viewed from the perspective of transaction costs, reforming Soviet agricultural institutions is understandably slow. The Soviet system has been in place for decades and the party and the government it controls have vested interests in it. The individuals who manage present Soviet agriculture institutions also have vested interests in those institutions. Further, there are extensive sunk investments in physical capital specific to the needs of the present institutional structure of Soviet agriculture—state farm facilities and the like. Institutional reforms for Soviet agriculture involve more dismantling costs than they did in socialist China and Hungary. Hence, reforms are likely to be marginal, more gradual, and much less extensive than those in China since the demise of the Gang of Four, and probably less significant than the conservative gradual reforms of Hungary.

The United States plays a difficult institutional role in trade and international finance that is important for the agricultural systems of the world. It is a major country whose monetary unit, the dollar, denominates most international transactions. Deficit financing by the U.S. government affords many opportunities for other countries and the U.S. itself to engage in what North (1981) and Williamson (1985) refer to as malevolent "opportunism." The U.S. is now the world's largest debtor nation. For several decades Western European countries, Japan, some newly industrialized Asian countries, and the petroleum exporting countries have built up productive capacity, reduced indebtedness and(or) built up their dollar reserves from U.S. reconstruction assistance, military expenditures in Europe and Asia, war expenditures, and, more recently, by running trade deficits against the United States. They made their dollar reserves good first by cashing them in against U.S. gold reserves (until those became inadequate in 1971 for this purpose), then by purchasing U.S. securities, stocks, and real property, and lately by loaning their dollar reserves to the U.S. Treasury to cover U.S. fiscal deficits. The holders of Euro-, petro and Asian dollars have suffered losses from depreciation of the U.S. dollar in a number of rather dramatic instances and the United States (includ-

ing its consumers) has opportunistically taken advantage of such losses. However, it is also true that the two U.S. deficits (fiscal and trade), reconstruction assistance, military expenditure, developmental assistance including concessional loans and sales, and, in some instances, the general schedule of preferences have permitted Japan, Korea, Taiwan, and Western Europe to "prime their economic pumps" opportunistically almost since World War II in ways that have promoted their growth and prosperity. The United States did (or permitted) this in order to help rebuild Western Europe and Japan and to help create the present economies of South Korea and Taiwan as part of a stronger free world. In addition, there has been an almost conscious collusion between those in the United States who wanted to use fiscal deficits to fund the domestic, international, and military programs of the United States and those in Japan, Western Europe, Korea, and Taiwan who wanted to run trade surpluses with the United States to expand their own economies.

Whether or not the above view of the historical roles of the U.S. fiscal and trade deficits is accurate, it appears that the decades-long era of U.S. fiscal deficits and unfavorable trade balances is going to have to end. When it does, there will be major adverse impacts for newly industrialized Asian countries, Japan, and the developed countries of Europe that have become highly dependent on benefits from the two U.S. deficits. The recent stock market disaster and the current plunge in the value of the U.S. dollar attest to the major transaction costs that may be ahead as the West European developed countries, Japan, and the newly industrialized Asian countries face the necessary adjustments in their fixed investments and institutions. Institutional changes with high transaction costs will be needed.

Socialist China and India are both large less developed countries. They also share a history of being internally rather than export oriented. Socialist China now seems to be moving to more of an export orientation. If the above view of the possible impacts of eliminating the U.S. fiscal and trade deficit has any validity, the United States is not likely to be willing and able to run trade deficits large enough to bestow on socialist China benefits comparable to those bestowed in the past on Western Europe, Japan, Taiwan, and South Korea. The same would also apply to India were it to become as export oriented as Japan, Taiwan, and South Korea. Socialist China, India, and, indeed, Japan, Western Europe, Taiwan, and South Korea must now consider producing more for their own markets and prepare for more balanced trade with the United States. It is likely true that Japan, Western Europe, Taiwan, and South Korea are substantially overinvested in export-specific assets

(automobile factories, steel mills, shipyards and the like) targeted on the U.S. market. These investments may have to be revalued downward and allocated on an opportunity cost or shadow price basis in the future in ways that will impose significant capital losses on their owners.

Generally the agricultures of the less developed countries of Africa, South America, and the Middle East suffer at least as much from institutional constraints as from lack of technology. They are also severely constrained by lack of human capital. Further, the lack of human capital and inadequate (sometimes corrupt) institutions tend to foreclose the self generation and use of much biological and physical capital. The same is true for the effective use of the borrowed capital and capital grants. Some less developed countries (Tanzania, Cuba, Angola, and Nicaragua) have followed the earlier Soviet institutional pattern with even less success than the Eastern European socialist countries. Cuba paid high transaction costs to establish her socialist institutions. Such costs were lower in Tanzania (which avoided war) than in Cuba, Angola, and Nicaragua. Tanzania, like China after the Red Guard period, now appears to be paying only moderate dismantlement costs in shifting away from some of her least appropriate (and least productive) institutional arrangements. In the rest of Latin America and Africa a difficult quest is on for new institutional arrangements. Unlike Taiwan, South Korea, Western Europe, and Japan after World War II, some of these countries lack the human capital required to devise and effectively update their agricultural institutions. Further, even if they have the human capital, they are unlikely to be the beneficiaries of the large scale United States reconstruction, developmental, and even military expenditures that helped those countries reconstruct and build. Still further, Latin American and African countries face a United States that is already absorbing more imports than it is paying for. The United States cannot open its markets to prime the pumps of Latin American and African less developed countries; historical records of Japan and Western Europe indicate that these countries are not likely to open their markets either. Like India and China, these less developed countries are likely to have to follow the slower route of tailoring their institutions, industries, and agriculture to fill their own domestic needs while competing in a subsidized restricted world for limited export opportunities. But that is not the end of the matter, Japan, Western Europe, and the Asian newly industrialized countries are likely to be adversely impacted and in turmoil because of institutional changes (agricultural and other) forced on or taken by the United States. This turmoil is likely to affect agricultural sector states in less developed countries more adversely than it does those of Japan, Europe, and the newly industrialized Asian countries.

NEEDS FOR REFORMS IN AGRICULTURAL INSTITUTIONS

From the preceding discussion, the following conclusions can be reached:

1. The agricultural institutions of developed, newly industrialized and less developed countries are in such disarray that institutional deficiencies impose more important constraints on agricultural production and adjustment than lack of available technologies and biological and physical resources. Human resource limitations are probably less constraining than institutional deficiencies but more constraining than the limitations of technology and bio/physical capital and resources.
2. The institutional deficiencies for agricultures in developed and newly industrialized countries are such that resolution of the institutional deficiencies of less developed countries' agricultures depends on how, when, and if the developed countries (particularly the United States) and newly industrialized countries resolve theirs.
3. It is important, therefore, that agricultural institutions be researched to improve our understanding of institutional changes to assist in their modification and improvement. The need for improvement is both domestic and international. Internationally, the need exists at least as much for the developed and newly industrialized countries as for the less developed countries. These two institutional worlds are so closely related however that they must be researched together as intradependent parts of a whole.
4. Without improvements in the formal and informal agricultural institutions of the less developed countries, the improvement and development of their agricultures will be so limited by institutional constraints that effort to develop their agricultural technologies, physical and biological resource bases, and even their people (human capital) will have only limited impact. Nonetheless, such efforts should not be curtailed for reasons given in conclusion 7.
5. For researching institutional change, the induced institutional change hypothesis commonly used by Ruttan and Hyami needs to be extended so as to more fully include the transaction costs/institutional approach outlined by Williamson and North. So extended, it will better explain institution rigidities and flexibilities and mistaken institutional changes, and make us keenly aware that all induced institutional changes should not be expected to be improvements.

a. Institutional establishment and dismantlement costs make uptransaction costs with respect to institutions. Institutions also affect production transaction costs for durable productive assets. Production transaction costs combine with imperfect knowledge to generate costly investment errors. Similar errors are made in establishing agricultural institutions.
b. As a consequence of "a" immediately above, market failures are to be expected when investments are made in durable production assets and institutional arrangements.
c. Understanding these two market failures requires more than economics because both the costs and returns of these failures are not fully understandable if their societal, anthropological, geographical, and political dimensions are not researched.

6. Conclusion 5c makes cases for rural sociological, rural political science, historical, and rural anthropological research as well as agricultural economics research on institutions.
7. While the world's agricultural situation examined in this paper establishes a very high priority for research, extension, advisory, consulting, administrative, and assistance efforts by rural social scientists to understand and improve agricultural institutions, we should not substantially diminish our efforts to improve agricultural technologies, agriculture's natural and man-made physical and biological resources, and human agricultural capital. Success in overcoming institutional limitations along with consequent increases in per capita income and larger populations will lead to a need for better technology, more biological and physical resources, and improved human capital in the future as institutions are improved.

In effect, these conclusions call for additional worldwide expenditures on agricultural development, research, extension, and administration. Much of the development expenditures can and should be in private sectors. Generating new technology, natural resource development and conservation. The building of bio/physical capital bases, and human development are long-term processes not to be curtailed in the short run. This means that for the most part we cannot reallocate research and other resources from other parts of agriculture to institutional research and other efforts to meet the urgent institutional challenge described herein. Now or after our institutional failures become still more drastic and demanding, we must address the failures of our agricultural institutions with many more resources than we now devote to this end.

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THE CASE FOR REFOCUSING ON DEVELOPMENT OF HUMAN RESOURCES AND INSTITUTIONAL CAPACITY

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It is commonly, and I believe validly, asserted that the hunger problem is basically a poverty problem. The global trade glut of agricultural (food) commodities, the depressed condition in production agriculture, and the exercise of production-constraining policies all reinforce this conclusion. The route to food sufficiency and security for a given area is, then, economic development, which is an incentive for indigenous production and distribution and capacity for participation in international trade.

But, economic development must be based upon the resources and characteristics of the country or area involved. For many developing countries, especially in Africa, the resources inventory tends to be long on land and people. This circumstance directs particular development effort to the arena of agriculture. This in turn means that progress is manifested as enhanced food security, either directly or through earned foreign exchange for importation. Historic examples of development successes suggest the likelihood of a combination of increased production of local commodities and a broadened dietary regime involving imported commodities.

History, as well as reason, also suggests that development is a long term process. It requires not only sustained effort but consistent effort. Real sustainable progress does not often result from "quick fix" politically defined thrusts. Nor is the development goal optimally served by 2- or 3-year donor input horizons, shifts in the attitude of the U.S. Agency for International Development (USAID) that are related to personnel rotations, or politically induced vacillations.

Sustainability is an essential characteristic of real development progress. This applies to the continuing benefit of development accomplished. It also applies to the process of continuing development. The latter inherently provides the former. Sustainability must incorporate survivability after eventual weaning from donor inputs. Thus real progress must be in the form of indigenous

capability and the institutional capacity to utilize, preserve, and expand that capability.

Admittedly this rationale involves over-simplification and perhaps geographic area exceptions. However, it seems basically valid for much of the developing world. It is also verified by experiences of past programs, both successes and those others not often cited.

What does this mean for United States participation in development assistance programs for the 1990s? It seems obvious that it should cause us to focus our efforts on

- human resource development for a spectrum of functions including education, policy formulation, administrative/management, scientific, technical and operational
- institutional development for productive expression of the human resource capabilities and for sustaining and expanding that resource pool
- international linkages for viability maintenance and growth of people and institutions through mutually stimulating communication and collaboration

It means returning to the thrusts of our development assistance programs of the 25 year period immediately following World War II. It means focus on education of key personnel and development of educational institutions. But it also means institutions, public and private, for generating and executing development policies, technologies and practices. It means learning from the success examples of Brazil, India, Taiwan, Thailand, Morocco, and others.

Other national development successes of that era and form—Ethiopia, Colombia, Nigeria, and the Philippines—have become rather frustrated by internal turbulence and stress. But even in these situations, the trained people and established institutional capacity remain. There is residual accomplishment. Equipment disappears or deteriorates, money dissipates (perhaps while substituting dependency for initiative), food is consumed, and expatriate substitutes leave. But trained nationals and institutional development continue.

To be sure, developing country conditions vary through time and circumstances; Chad is not another Brazil nor Botswana a Taiwan. Most countries of Africa and many of south Asia are very young in their independence. They lack the experience, infrastructure, and international posture of an India, Taiwan, or Brazil. Development assistance programs must be fitted to their circumstances. Neither can the stencil of development stages of more developed countries be applied. U.S. farmers did not shift from a hand scythe to a horse-drawn reaper with knowledge of self-propelled combines. They at any stage moved to the most advanced

known technology. Illiterate peasants of Upper Volta know of the existence of advanced methodologies. This knowledge changes things.

But what is unchanged is the basic need for people equipped to develop their own initiatives and institutional mechanisms to implement the processes. This need is where our aid should be focused, even as it was 25 years ago, yielding the examples we now like to cite. This is the concept of the authors of Title XII although it has not been extensively implemented in that manner. Congressman Paul Findley, who together with Senator Hubert Humphrey sponsored the Title XII legislation, recently wrote:

> Support for building agricultural universities has been the heart of USAID programs since the launching of formal U.S. technical assistance. The experience of the 1950s and 1960s showed that long-term sustained commitment was essential, that there was no cookbook made to follow, that pay-off was long-term, and that patience was required.
>
> There were three main reasons why I supported the university contract idea. First, I felt that there was an important potential in the long-term relationships between an American university and a university of another country. Second, I felt that given the educational nature of technical assistance, a university was a most natural institution for carrying it out. Third, universities were repositories of the expertise which had to be tapped if an acceptable program were to be carried out.

The concept is still valid. Unfortunately, USAID programming of this form has decreased in relative emphasis since 1980. Emphasis has shifted away from educationally focused technical assistance to food aid and economic aid. The evolved pattern is quite completely counter to this rationale and the lessons of the past.

Food aid on an emergency basis, à la Ethiopia, is certainly not to be argued against. But food aid on a regular basis, even food for work, is not leading to a lasting solution for chronic food deficiencies and is not a practical solution to U.S. surplus production. Indeed, it may have a counter effect on development of real food security.

Similarly, check writing for economic aid, unrelated to technical development assistance, is not yielding development toward long term stability and self-sufficiency. Rather it tends to engender addiction and disincentives to real development. Superimposed on this concern is the low correlation of the most massive economic aid checks to the severity of poverty and hunger, and the relatively conspicuous political pressure dimension of the process.

For real indigenous sustainable progress, U.S. bilateral assistance should undergo a major shift back to human resource and institutional development.

PART 6

FARM AND TRADE POLICY ISSUES IN THIRD WORLD DEVELOPMENT

TOMORROW'S ENVIRONMENT FOR AGRICULTURAL DEVELOPMENT

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World farm commodity prices are virtually certain to continue their long-term decline and could fall quite sharply in coming years. New technology, more incentive-oriented farm policies, and normal resource development continue to increase farm productivity potential in most countries. These factors are amplified by ample capital for resource development and production subsidies in the affluent countries.

If the world's current farm-trade rules stay in place, most countries will probably continue to seek agricultural self-sufficiency in response to technical capabilities and the pressures of their own farm lobbies. Export potential is not likely to grow as rapidly as production potential with the current pervasive use of trade constraints. Less-developed countries and developed-country farm exporters would thus be thrown into a fierce competition to sell increasing farm-product volumes in a stagnant or declining market. Prices would fall to drive out countries, farmers, or inputs not needed to meet the effective trade demand.

Even if the world's farm-trade rules are reformed, world prices are likely to come down sharply. The farm-surplus capacity of affluent countries now equals at least 150 million grain-equivalent tons per year, and it continues to rise. (The 1987 U.S. cropland-diversion program alone represented about 110 million tons of grain surplus.) That volume of surplus could not possibly be sold at current prices, even if the world's farm-trade barriers were immediately eliminated. Thus, prices would have to come down to discourage the use of some purchased inputs and to encourage more consumers to improve their diets with lower-cost protein foods.

In the long term, lower costs and continued research developments may permit farms to produce some industrial feedstocks cost-competitively, expanding farm markets beyond their traditional food-and-fiber base and permitting farm resources to make a larger economic contribution. However, low costs will be crucial to such a development, so industrial sales are likely to expand sales volume rather than raise asset and product prices.

If farmers in less-developed countries (LDCs) face a continued decline in commodity prices, then the outlines of appropriate farm

and development policies are harsh and clear. A continued flow of farm research must provide land-enhancing farm technologies with low out-of-pocket costs. There will be no price boom to furnish large chunks of investment capital, so governments will have to encourage their citizens and business people to invest in the farm technologies and infrastructure necessary to lead economic growth.

Exports of raw commodities will be even less effective as engines of growth. The big gains from agricultural development in less-developed countries will be adequate nutrition (and thus political and economic stability), low-cost wage goods for nonfarm workers, and low-cost industrial raw materials for labor-intensive industries. (Examples include cotton and other fibers for textiles, leather for shoes and other leather goods, and sugar and fruits for confections.)

The less-developed countries will have no more farm surplus to tax than they have had in the past, and possibly less. It will be terribly difficult for agriculture to grow if governments perpetuate their policy mistakes such as supporting inefficient and overstaffed parastatals, overvaluing exchange rates, and making discouraging tax policies.

The biggest success in agricultural development aid has been and probably will continue to be the building of successful agricultural research institutions. The second-biggest success has been training for professional scientists from developing countries. (The training and research have apparently yielded high profits for the agricultures and economies of both developed and developing countries.)

Other types of development aid have been less successful than research and training. One major reason may be that the characteristically weak governmental, scientific, and economic institutions of developing countries were not capable of properly supporting or absorbing the other types of large aid programs.

The success of China and countries in the Association of Southeast Asian Nations during recent years strongly suggests that one of the keys to development success is dynamic national economic policies that favor competition. Aid programs have typically been administered on a noncompetitive, government-to-government basis. It may be possible to achieve stronger rates of development growth if aid programs can be made more competitive. Perhaps this could be achieved by going below the level of the national government and offering loans and grants to smaller institutions within developing countries such as farmer cooperatives, key industries, or even tribes and villages. Such a shift toward competition implies major changes in the way aid is administered by donors and

received by developing countries; however, the famine impetus for aid is fading fast. Failure to achieve better development results may mean that the relevance of development aid will decline significantly or even that aid will disappear in a cloud of public apathy and competitive hostility.

THE FACTORS FORCING FARM CHANGE

Agricultural development programs have achieved some amazing success stories, starting with the green revolution and continuing to the present. Development programs have contributed importantly to the world's remarkable progress toward adequate food supplies. Moreover, agricultural development still has a major contribution to make so long as billions of people still are not eating as well as they would like and most of the world's poverty is in rural areas. However, agricultural development will face a radically different policy environment in the years ahead because the context of world agriculture is changing radically and rapidly.

The biggest factor that is causing change is the enormous progress being made in world food production. The World Bank recently estimated that per capita food production has been gaining about one percentage point per year worldwide since 1980. In the 1980s world population has been growing about 1.8% annually while, outside the United States, grain production has been rising at 2.8% per year and oilseed production has been rising at 4.5% to 5%. (U.S. production is heavily skewed by its residual-exporter status and its cropland-diversion programs.)

Not all of the developing world has participated equally in the global food-production gains. Africa, in particular, remains on the borderline of food self-sufficiency; however, most African countries have had trouble using and storing the increased grain production stimulated by the 1983-84 drought, which points up both the latent food-production potential in that continent and the terrible inelasticity of food demand among low-income consumers. At least five sub-Saharan African nations were active in the world grain-export market in 1987 because they have no livestock industries to absorb extra grain, little storage, and a shortage of capital to hold grain against future droughts.

The recent famines in the world correlate with the presence of armed conflict, national policies that discourage farmers, and the absence of national agricultural research activities, rather than with lack of agricultural resources.

Technology

Better agricultural technologies—especially better seeds—have spread rapidly in most of the world's countries. Wheat yields in western Europe have tripled since 1960. Asian rice yields have nearly tripled in the same period. Triticale, brought to a high stage of development by the International Center for Wheat and Maize Research (CIMMYT), is the latest miracle crop in Poland and Portugal and is being test-planted in 50 other countries. China has pioneered the world's first hybrid rice varieties. Plantings of hybrid sunflower are rapidly expanding in Italy, the Soviet Union, Argentina, and Thailand. Nigeria has high-yielding new cassava and Sudan has high-yielding new sorghum. Shorter-season corn hybrids are moving north in China, Poland, East Germany, the USSR and south in Argentina. Brazil has just announced the first high-yielding corn hybrid for the aluminum-saturated tropical soils that constrain corn yields in its Cerrado Plateau: BR-201 yields up to 135 bushels per acre in a country with a national average of 40 bushels

The impact of better seeds is being amplified by fertilizers that are available at declining real costs per ton of production, by irrigation that has rising rates of water efficiency, by more effective pesticides with fewer ecological impacts, and by a host of new farming systems and processing technologies.

The impacts of better technologies, as always, are rippling around the world. Wheat seeds were carried out from the Old World to the new, and New World corn and tomatoes were carried to the Old World; so the semidwarf green revolution wheat and rice varieties have spread and have been adapted by national research programs in many places where they initially were not effective. The latest palm oil varieties, developed in Southeast Asia, are now being planted in Latin America and are probably also headed back to their point of origin in West Africa. The HYV soft winter wheat varieties pioneered by British researchers have spread across Europe as far as Germany and Poland. Brazil's new corn hybrid probably has potential for much of South America—and for much of southern and western Africa where aluminum-saturated soils are a major corn-production constraint.

Conservation tillage has spread rapidly on the world's mechanized farms in the last dozen years, cutting soil erosion and tractor fuel costs. India and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) have developed a tillage system that gives two good crops a year instead of one poor one from millions of hectares of cracking-clay soils; the system has been widely adopted in India and is now being extended to Sudan and

Ethiopia. Ridge tillage saves more water and thus raises crop yields 20% in eastern Africa; tied ridges offer even greater potential in western Africa. Alley cropping now offers the first fully sustainable cropping system ever available in much of western Africa.

The impacts of new farm technology are most visible in the developed countries, where education, capital, infrastructure—and often subsidies—speed rates of adoption. Yields have risen much faster than demand in the first world, stacking millions of tons of surplus grain, sugar, and livestock products in government warehouses. The Organization for Economic Cooperation and Development (OECD) says farm production in its member countries has been rising 1.5% per capita in the 1980s while per capita consumption has been stagnant. At least 35 countries now consistently produce farm surpluses. The use of the farm subsidies that have stimulated these surpluses is broadening beyond the affluent countries to such newly emerging economies as South Korea, Taiwan, India, and Brazil.

Agricultural progress is less visibly startling but still very rapid in the third world as well—probably more rapid than most of the world realizes. Yield trends are not rising as rapidly in developing countries as in developed countries, but they are generally rising as rapidly as effective consumer demand. We have too often overestimated the impact of population growth on world food needs. Relatively few agricultural resources are needed to meet people's minimal caloric needs through direct consumption of cereals and root crops. Moreover, many of those needs can be satisfied through the consumer's own more intensive efforts at subsistence cultivation. We have too often underestimated the importance of per capita income growth on world food demand. Far more resources, both on and off the farms, are needed to satisfy the demand of affluent consumers for high-value, high-protein diets.

Africa's nations may continue trying to export their food surpluses for another decade or more until higher consumer incomes or sharply lower real farm-production costs expand their livestock industries and effective demand.

China offers an opposite example. Consumer demand for protein foods has been rising very rapidly despite low per capita incomes; however, the Chinese government has chosen to subsidize its consumers with relatively low prices for those foods. If and when consumers must pay the real cost of producing those foods (as opposed to letting farmers export them or raise other cash crops), then consumption patterns are likely to fall quickly back toward the more common patterns.

The International Center for Tropical Agriculture has done a wonderful job of breeding food-bean varieties with radically

increased yields for Latin America. National yield trends do not show much increase, however, because food-bean demand is relatively static. The mere potential for higher yields does not spur rapid adoption. Most of the bean production is for subsistence. The easiest way to grow food beans in the region is to throw a few seeds on a hillside and chop weeds onto them. That system offers very low labor costs, little erosion, and fair disease protection. Unless population growth or urbanization produce a commercial market for more beans, farmers won't reach out for the new varieties even if their only cost is a 5-mile walk for the seed.

Those who argue that agricultural technology has not made much impact because the yield trends have not increased may be looking at the demand constraint and underestimating the long-term increases in productive potential. When effective demand does increase in those areas, new technologies and local resource development may make the farmers of developing countries competitive in supplying a major part of it.

Farm Policy Reform

In recent decades, the developing world has learned some important lessons about national policies that encourage agricultural productivity. Some of these lessons have been learned the hard way, by playing out poor policies to the point of inducing stress failures in live economies.

The consensus is growing that the success model for agricultural policy in developing countries is based on small family farms, national research programs, effective farmer education, and price incentives.

Perhaps the most dramatic case for this model has been made by China, which broke up its communal farms after 1979, leased the land back to families and small work groups, and raised farm-gate prices by roughly 25%. Chinese agricultural output promptly rose by a third in 6 years. China still has enormous agricultural development problems ahead, particularly in pricing and transportation development; but the basic success of its family-farm, market-oriented agriculture is beyond doubt.

Kenya and Zimbabwe have demonstrated the value of the family-farm success model in Africa. Kenya has had Africa's most successful agriculture, in terms of food security and the contribution of cash crops to its economy, over the years since 1960. Its agriculture was consciously developed along family farming lines. Neighboring Tanzania, with very similar farming resources, attempted to use a centrally planned, command farming model based on pulling scattered family farms into socialized farming

villages. But the government was unable to provide the technology and expertise that would have modernized farming methods. Farmers were discouraged by low prices and communal land tenure, and they retreated into subsistence production. Tanzania's national economy was then devastated by lack of the foreign exchange, which had been provided by such cash crops as cotton, cashews, and coffee.

Zimbabwe in the 1980s has cleaned up its corn hybrids and begun actively encouraging its traditional small farmers to use the seeds with extension efforts and price incentives. Zimbabwe has recently produced more grain than it consumes and is now shifting farm resources to expand oilseed production.

One of the most interesting experimental comparisons is in El Salvador. Salvador's large cooperative farms are doing poorly despite having the country's best land, while the tiny Phase III owner-operator farms on marginal land are raising their yields, adding tools, planting tree crops, making conservation investments—and buying more land.

Even in plantation crops, recent experience seems to favor the *outgrower system* in which only a core plantation immediately surrounding the processing facility is centrally managed. Outlying land is more successful when intensively managed by small farmers who contract with the core processor.

Other alternatives have certainly been tried: Ethiopia has tried state farms, and gotten dismal productivity that left the country open to repeated widespread famine. Nigeria put huge sums of cash into corporate mechanized farms, and the machinery now rusts in abandoned fields. Malawi established tobacco plantations that were relatively successful in raising tobacco output quickly—but also produced more alienated, landless, and jobless people.

The third world has also learned that incentives are crucially important for farm support functions. Too many countries put fertilizer distribution and crop marketing in the hands of government-sponsored monopolies with too little incentive to get inputs into the farther corners and too much interest in finding jobs for cronies. In Ghana, by 1985, the Cocoa Marketing Board had a staff of 103,000; in the 1950s, the board had exported four times as much cocoa with less than a tenth the staff. Even in Kenya, grain marketing charges are still so high that only about 10% of the crop is marketed off the farm; farmers apparently plant enough for their own needs plus a margin against lack of rain, and the grain board gets the surplus from those farms that have good rainfall.

A host of countries found that overvalued exchange rates effectively penalized their agricultures by making food imports seem cheaper and farm exports less valuable.

Resource Development

Many developing countries also have continued to develop unused or underused resources, and even more such resources are likely to be developed as effective demand rises.

- Turkey is building a series of dams on the upper Euphrates River which will produce electric power and irrigate millions of hectares of land now in low-yield dryland farming.
- Kenya has huge tracts of land between Nairobi and the sea that are too dry for corn but which could produce sunflower seed, peanuts, sorghum, and other crops.
- The big plain surrounding Ghana's capital city, Accra, is similarly too dry for corn and largely uncropped; a poultry industry could be founded there using sorghum, sunflower seed, and fishmeal from the adjoining ocean.
- Brazil estimates it has 50 million hectares of brushland on its Cerrado Plateau that could be converted into productive cropland with phosphate and lime. Brazil wants to build three railroads into the region that would move farm products cheaply to its northeastern food deficit region and to export ports on the coast.
- Sudan has huge tracts of arable land in its southern and western regions, though they lack the infrastructure to support commercial farming.

Even where there are no extensive unused resources, economic growth normally stimulates farmers to keep improving their productivity with water conservation, subsoil tillage, terracing, double-cropping, higher plant populations, tree crops, and other more intensive management techniques.

We should expect such resources to become more fully developed in the normal course of economic growth, and their latent productivity potential should be projected more carefully than it has been.

Farm Subsidy Failures

The last factor forcing farm change, farm subsidies, has proven a poor way to generate productivity and growth. The OECD has recently estimated that the cost of farm and consumer food subsidies in its member countries doubled between 1979 and 1986 without bringing the countries noticeably closer to their intended farm policy goals. In less-developed countries, subsidies have generally failed to raise productivity and efficiency:

- Fertilizer subsidies tended to go to political supporters and encouraged graft, with far less than optimum use and production

gain from the scarce input.

- Subsidies to commercial farms in such countries as Zaire and Zimbabwe produced modern-looking commercial farms that spent too much on off-farm inputs, while the huge latent productivity of their traditional sectors lay untapped.
- Price subsidies were often unable to overcome the constraints on market-oriented farming, such as overvalued exchange rates, high tax rates, etc.
- Price supports and trade barriers in the developed countries mainly boosted farm land values and diverted more capital into farm chemicals and machinery. Thus they raised farmers' costs and diminished the real opportunities for family farms in the subsidizing countries while they increasingly distorted world farm production patterns.
- When farm subsidies and trade barriers are used pervasively, as they have been in recent years, it is now clear that even their short-term benefits for recipient farmers tend to cancel out, leaving farm costs higher, the total market for all farmers smaller, and the world's consumers and taxpayers worse off. Basically, subsidies have led to dreadfully wasteful resource use.

FAMINE RATIONALE FADING

The world's improving food production is bound to produce changes in the public attitudes toward agricultural development. Aid's strongest political weapon until now has been the threat of famine. Lately, the famine weapon has been fading rapidly. India suffered its worst monsoon failure of this century in 1987—and had enough grain stockpiled from previous big crops to cover a shortfall of more than 20 million tons. During the 1960s, tens of millions of tons of grain imports were needed to prevent Indian famines.

Some African countries have reformed some of their most discouraging farm policies, and countries like Zimbabwe and Nigeria are aggressively seeking farm productivity. The next major continental drought in Africa will again produce widespread hunger—but in less stressed years, most African countries will likely feed their populations at least minimally adequate diets.

The success stories of more successful countries, both in Africa and elsewhere, should spotlight the negative policies of the famine-stricken countries. Already, the public is learning to associate famine with armed conflict and repressive governments (Ethiopia, Mozambique, and Tanzania).

The development organizations have too long relied on famine predictions to sell development. Now, with famine fading as a

program rationale, they will have to make the correct but more abstract economic growth arguments for agricultural development aid. Unfortunately, they must now make them while first world publics are thinking about trade and budget deficits.

The agricultural development community also must struggle with the increasing perception of developed-country farmers that third world agricultural development is a threat to their own incomes and land values. This perception is almost certainly wrong; the farmers of the affluent world have no stake in continuing poverty in the third world. Moreover, during the middle stages of economic growth, countries' agricultural imports tend to rise rapidly. But so long as relatively high prices limit farm products to food and fiber, farmers of the first and third worlds really are in competition.

A few first world farmers, of course, still harbor illusions that their farm surplus problems can be solved through massive food aid giveaways. Even leaving aside the impact of food aid dependence on farmers in less-developed countries, there simply isn't much demand for food aid these days. Food aid has averaged less than 10 million tons per year in recent decades, and that is a tiny fraction of the first world food surplus. Even during the last big Africa drought, donors managed to get only an additional 10 million tons of aid through the pitifully inadequate transport systems of such remote places as the Sahel, western Sudan, and Mozambique.

In this age of high-tech seeds and farming systems, very few countries could not produce their own base diets at less real cost than importing grain. First world farm exports really support luxury diets. Thus the true interest of first world farmers should be to the stimulate third world economic growth that will permit billions more consumers to afford protein foods—even when that economic growth starts with agricultural gains. (Equally important, first world farmers should strive for freer trade in farm products, so that they will have market access for their specialties when third world countries reach affluence.)

LDCs AND THE FARM TRADE CRISIS

Self-sufficiency has been perhaps the second-strongest trend in world agriculture this decade (behind rising productivity). Over the last decade, increased food production has supported important diet improvements in most of the world's countries, even though the world's volume of trade in grain and soybeans has virtually stagnated.

Many countries have been major growth markets for farm exports in the early stages of their industrial development, when large numbers of nonfarm workers suddenly get improved incomes and spend a high proportion of their gains on food and clothing. The tendency has been, however, for the farm import growth to slow and even reverse later in the development process. Then consumers are already eating and dressing well, so more income doesn't add much demand. Meanwhile, domestic farmers typically have continued to raise their production through new technologies and investments in land and infrastructure.

Western Europe was once a fast-growing market for farm imports, instead of the world's second-largest exporting region. Eastern Europe has shifted from a major net importer to a modest exporter—and looks fully capable of providing whatever diet improvements its consumers can afford in future years. The Soviet Union has been the only growth market for farm exports in the affluent world over the last dozen years —and now the Soviets may be joining the trend toward higher crop yields and import displacement.

Countries like Japan and South Korea have been contributing to the self-sufficiency trend by constraining their consumers with high prices and quotas. Even India has subsidized soybean crushers to add noneconomic incentives for Indian soybean expansion.

If the world's current rules for farm trade remain in place in the years ahead, we can expect most of the world's nations to continue seeking farm self-sufficiency with all of the power that modern technology and capital can provide. Only the most resource-constrained economies (such as Hong Kong, Singapore, Japan, and Switzerland) would fail to achieve it.

East Germany, to offer one example, is currently encouraging short-season corn to displace its corn imports, and a new ultra-high-protein wheat to displace durum wheat imports. East Germany also can use more wheat for its starch production, which not only displaces corn for starch but yields wheat germ as a by-product to strengthen its own soft wheat and reduce hard wheat imports. A new plant has been built to de-hull barley, lowering its fiber content enough so barley can substitute for corn in hog rations. Low-acid rapeseed is substituting for imported soybeans in cooking oil and feed rations.

The European Community has reacted to surpluses of grain and livestock products by heavily subsidizing an eight-fold expansion of its oilseed production. Italy has raised its soybean production from virtually zero in 1980 to 1.3 million tons in 1987 (75% of its consumption), and could be self-sufficient in soybeans within the next two crop years. French pulse crops have expanded eight-fold

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too, with the peas and beans going into livestock feed.

India has subsidized construction of 3 million tons of soybean crushing capacity—but the country's biggest crop has been 1 million tons even though prices are higher than the world market. The government refuses to import beans, telling the crushers they must find a way to get the beans produced. Were the crushing plants the best use for India's scarce capital?

Much of such import displacement is conducted under the guises of food security and rural development, but most of it is a political response to domestic farm lobbies. Farmers are a strong lobby in every successful economy. Everywhere, farmers are widely seen as hard-working, stable, and family-oriented. Often it has been the increased productivity of these farmers that has laid the foundation for the country's leap into modernity—producing a low-cost food surplus that permits urban and industrial growth.

Without the discipline of tough international trade rules, the world's politicians are almost universally willing to seal their borders in response to farmer protests. (Taiwan and Sweden are both currently trying to cut off fruit imports in response to farmer protests.) History also indicates that once such subsidies or trade barriers have been installed, they are terribly difficult to eliminate.

A continuation of the trend toward self-sufficiency would drive down both the volumes and prices in world farm trade, putting a double whammy on farm export earnings. That also has ominous implications for third world earnings from agricultural development.

Possibility of Farm Trade Reform

The only realistic alternative to the current farm self-sufficiency trend would be a major reform of world farm trade rules. Such a reform would have to be modeled on the GATT rules for nonfarm trade, which forbid such trade interventions as import quotas and export subsidies, and give a strong role to comparative advantage.

Most agricultural experts still believe it naive if not foolish to predict an end to the world's pervasive use of farm subsidies and trade barriers. The pattern has been familiar for more than 100 years. But five major factors are forcing farm policy changes:

- The continuing flows of new technology and off-farm inputs have made it terribly dangerous for any government to guarantee a price for all that farmers can produce. Rising yields and declining real production costs increased the cost of farm subsidies five-fold in the affluent countries since 1970 and doubled them in the last decade.

- Most OECD governments already face budget deficits, so it will be difficult for them to keep farm subsidies at their current levels, let alone increase them.
- Since the farmer benefits of a given subsidy level are dissipated quickly in higher land values and increased input purchases, subsidized farmers will face gradual decapitalization if subsidy rates don't increase.
- Export subsidies and import displacement have offered the only national-level solution to the farm surplus-farm income dilemma for most countries. Thus it is no surprise that the international frictions produced by farm protectionism have reached unprecedented levels in the last decade.
- Trade frictions are also exacerbated by increasing competition in the world economy for all goods and services, which forces even affluent countries like Canada and the United States to seek their real comparative advantages.

Farm subsidy programs are already changing rapidly under these pressures. West European countries have stopped raising price guarantees. The European Community has capped prices and now has set or proposed production quotas for nearly all products. Sweden is charging farmers the cost of exporting their meat surplus. The international frictions have set off a farm subsidy war directly engaging the United States, the European Community, and the 14 nations of the Cairns Group. Japan is getting serious pressure from the countries that buy its manufactured exports to open its farm trade barriers. South Korea and Taiwan are facing similar pressures.

Stable (farmers would say stagnating) farm subsidies are probably untenable for both farmers and politicians. But widespread farm bankruptcies are also politically difficult, so farmers and governments are faced with a dilemma.

Import displacement is usually the first reaction to the dilemma, but its costs are very high, both in cash and in trade frictions.

A second possible solution is the farm trade reform proposed by the United States in the current round of the General Agreement on Tariffs and Trade (GATT). The United States has essentially proposed a 10-year phase-out of all farm production subsidies and trade barriers. The reform has been basically endorsed by the 14 nations of the Cairns Group of farm exporters. It is probably a more realistic proposal than most other governments and farm lobbyists have conceded, but even the optimists give it no more than a 50-50 chance.

Essentially, reform would give each subsidizing nation 10 years to "buy down" inflated farm land values and help their farmers to a new, lower-cost, rising-sales environment. Governments would remain free to help their small farmers with direct income payments, so long as the payments were not tied to production. The reform would make cheaper food more widely available throughout the world. The biggest sales volume gains for farmers would come from offering lower-cost protein foods to the billions of consumers in newly industrializing countries who are not yet consuming more protein. Smaller—but quicker—gains could be found among the consumers in Japan and western Europe.

The first impacts of farm trade reform would be lower prices for temperate-zone farm products and lower land values for the farmers currently being subsidized.

Tyers and Anderson did an econometric study for the World Bank suggesting that world farm prices would rise 6% with trade liberalization. That result is hardly credible in light of the world's huge surplus in farm productive capacity. The world surplus is currently at least 150 million grain-equivalent tons per year, including over 100 million tons in the U.S. cropland diversion program, 30 million tons of subsidized grain and livestock products from western Europe, the land planted to sugar beets in the OECD countries, 2 million tons of Japanese rice and wheat, and 2 million tons of Saudi wheat. Prices must come down to balance demand with supply—partly by discouraging noneconomic use of purchased farm inputs and partly by encouraging more consumers to add more high-protein foods to their diets.

Farm management in the affluent countries would then quickly shift from "maximum yields" to "lowest out-of-pocket costs." Virtually all of the cropland and farmers currently in agriculture would stay in farming, because that is where their comparative advantages lie. Farm production —and costs—in the OECD countries would decline, however, as land values were written down (presumably with generous government transition payments) and the heavy use of purchased inputs was discouraged.

The second big short-term impact of farm trade reform would be increased farm exports for farmers in less developed countries, especially for sugar and red meat. The land currently planted to beet sugar in the OECD countries would be shifted to temperate-zone crops, mostly for production of meat, milk, and eggs. (Grain, oilseed, pulse, and legume crops are the most likely.) Cane sugar producers could expect a 60% increase in their sugar exports in a fairly short time frame. Subsidized exports of livestock products would also disappear, probably opening export opportunities for sales of cattle, sheep, and goats from third world pastures.

In the longer term, lower real costs and continuing research could broaden the definition of farm product to include industrial raw materials such as organic chemical feedstocks, cellulose, and perhaps even cost-effective ethanol. Meadowfoam offers an example of a potential industrial crop, producing a unique long-chain fatty acid that apparently can provide lubricating oil with exceptional performance at high temperatures and pressures. It should be useful in the high-value oil-additive market where lubricants sell for up to $50 per pound. If costs can be low enough, it could even penetrate the diesel and automotive oil markets. The economic gains from cropping currently idle land could be enormous.

IMPLICATIONS FOR LDC AGRICULTURAL DEVELOPMENT

Agriculture has long exhibited the classic declining trend in real prices, but a much sharper trend of decline in farm export earnings is in prospect for the next few years. If world trade rules are not reformed, third world agricultures face a continuation of world farm self-sufficiency that will cut export demand and drive down both prices and sales volumes for those farm products which seek buyers in the world market. If world trade rules are reformed, farmers in less-developed countries can expect lower prices and would also have to face import competition in their own domestic markets. However, they would gain opportunities for sharply increased export sales volumes in the commodities they produced most efficiently (and thus with the highest profits). Clearly, neither of these scenarios is ideal for developing countries' farm development, but reform would be far more advantageous to both agricultural development and nonfarm economic growth than national self-sufficiency.

The virtual certainty of continued low farm prices has enormously important implications for agricultural development aid. It means that developing countries must continue to seek the lowest possible production and infrastructure costs if their agricultures are to expand successfully. Thus a continued emphasis on land-enhancing farm technologies with low out-of-pocket costs will be necessary. There is not likely to be a significant commodity boom or price recovery that would give third world governments or corporate investors a surge of ready cash to finance growth investments in new land development, groves, storage silos, or farm-to-market roads. Such investments will have to be wrested one at a time by the farmers and business people of the country through their own

labor, savings, and investment.

Less-developed countries will have to continue their search for cost-effective ways to increase the economic contribution of their agricultures. They will retain their advantage in relatively low land and labor costs, along with their disadvantage in undeveloped infrastructure. They probably will continue to get relatively bigger yield gains from such research breakthroughs as new seed varieties, but suffer from the fact that they get fewer of these breakthroughs than most developed-country farmers and have more trouble exploiting them because of infrastructure constraints and the lack of well-developed market demand.

Perhaps even more important, lower prices mean that raw commodity exports will be somewhat less effective as engines of economic growth in the decades ahead. Instead, the key agricultural contributions to growth will be adequate nutrition (and thus political and economic stability), low-cost wage goods for nonfarm workers, and low-cost industrial raw materials for labor-intensive industries. (Examples are cotton and other fibers for textiles, leather for shoes and other leather goods, and sugar and fruits for confections.)

Developing countries will continue to face the need for reform of the national policies and priorities that have discouraged so many of their farmers in the past: Parastatal control of support functions with poor performance and high costs; overvalued exchange rates that made food imports seem cheaper than they really were; failure to recognize the enormous long-term profits that accrue to national farm research programs; food prices set at low levels to favor urban consumers rather than at levels which would call forth enough production to meet effective demand; uncertain land tenure; and tax policies that discouraged private savings and investment, especially for such key infrastructure investments as storage and processing facilities.

Even if the GATT farm trade rules are reformed to eliminate export subsidies and give third world agricultures access to more consumers in the future, any gains in sales volume and earnings will have to be won in intense competition with other developing countries and developed-country farmers. (Virtually all of the arable land in the OECD countries would remain in farming, and the U.S. cropland diversion program that in 1987 idled 28 million hectares would presumably end.)

AID SUCCESS LESSONS

Forty years of agricultural development experience all over the globe have provided some important lessons on how agricultural development aid should be shaped for greater effectiveness in the future, whatever the trade context.

There is no question that development aid's biggest agricultural success has been derived from fostering agricultural research. Every nation in the world by now should have learned that agricultural research investments pay enormous dividends. Development aid's first achievement was the set of international farm research centers now known as the Consultative Group on International Agricultural Research (CGIAR). CGIAR's first achievement was a green revolution that has never stopped.

The world knows that agricultural research should be amply funded in developing countries, since even ample research funding costs far less than food imports, farm subsidies, or even smuggling. If farm prices are to continue their decline, then research will be more important than ever to lower the real cost of farm products for wage goods and raw materials. The research program should be stable, since it is extremely difficult to build effective research institutions on an erratic basis. The research program should be free from political bias and controls; it should be equally free to pursue the most promising scientific possibilities from the standpoint of the developing country itself, rather than following such fads as *mechanization, small farmers,* or even *appropriate technology.*

International farm research successes are almost certain to continue. The international institutes now have more researchers, working in more countries from a broader base of knowledge, and using better tools than ever before.

The second largest success of international agricultural development aid has been the training of research professionals to staff national research programs. These training programs have transferred enormously important scientific skills for application in the trainees' home countries.

One example is all it takes to demonstrate the breadth and diversity that has keyed the success of the international farm research and training networks: The breakthrough sorghum hybrid for Sudan (and perhaps much of East Africa) was bred by an Ethiopian plant breeder, with a Ph.D. from Purdue, working in Sudan under the auspices of ICRISAT, using parent lines from higher yielding than traditional cultivars, but far more drought-resistant as well.

(The point should be made that developed country agricultures have probably gained enough new knowledge and genes to amply compensate for the research funding the first world has provided.)

There is virtually no question that agricultural development aid programs for the future should be keyed to the successes in research and training. However, these two programs account for a relatively small proportion of past aid activities and funds.

The big question is what development aid's failures say about the future directions for broader development success.

It is probably no accident that the international research and training programs are the activities that depended least on the weak governmental, scientific, and economic institutions that are characteristic of developing countries. (Countries with strong institutions in all of these areas typically cease to be less-developed countries fairly swiftly.)

The national programs of agricultural research that should support and extend the work of the international centers unfortunately offer no success story to parallel CGIAR. A few strong national research programs have emerged (Brazil, India, and increasingly, Indonesia). (China also qualifies as a national research success story, but it has received virtually no agricultural development aid in the period relevant to this analysis.) Rarely has third world government tried to tap for its farmers the benefits that go to early adopters of new technologies.

To a distressing extent, the huge funding provided for a wide variety of other development programs and resource transfers has produced few benefits. The programs have produced no discernible increases in development rates. In too many cases, the aid programs have actually legitimized institutions and policies that did not deserve it, and funded activities which actually hampered farmers and agricultural development (see the following examples):

- Soviet support encouraged the Mengistu government in Ethiopia to focus its agricultural development efforts on state farms. The state farms got the research-improved seed and the available fertilizer—and still achieved lower yields than the peasant farms using traditional technology. The country remains today hostage to every vagary of a harsh climate.
- The World Bank made major resource transfers on the basis of its ill-fated Basic Human Needs concept, which intended to help the "poorest of the poor" but which too often targeted places and activities with poor development potential, at least for the short and medium term.

Farmers in most developing countries remain at the mercy of overstaffed, undermotivated parastatals for their support func-

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tions. In Morocco, I was told that the fertilizer agency sometimes didn't get its product to the farther corners of the kingdom. In Sudan the cotton inputs often haven't arrived until after the planting season, even though cotton has been the country's major source of foreign exchange.

Corruption is a way of life for too many governments and government officials. More than one country's governing political cabal is funded directly from the farmer's market receipts. Urban elites have dominated too many government-to-government aid programs, siphoning off the employment and benefits that should have gone to rural areas, effectively stopping rural growth.

Perhaps the key remaining policy constraint in the whole third world is a lack of economic policies that favor competition. Too many countries say, "We already have two coffee exporters. Why do we need to license more exporters to feed off the blood of our farmers and produce price chaos?" But having only two licensees leaves the exporters with too little incentive to offer growers the best price, cut processing costs, absorb storage risks, and find new customers overseas.

Hernando De Soto's 1986 book on the Peruvian informal economy (*El Otro Sendero*) graphically documents the shortcomings of Peru's over-regulated formal economy. De Soto found, for example, that it took 289 man-days, 24 bribe solicitations, and two bribes to legally open a two-sewing-machine clothing factory. The same process in Miami took 4 hours. No wonder that the illegal sector provides most of the jobs, housing, and services for the city of Lima. No wonder the Peruvian economy has so little power to pull its people out of poverty. No wonder it has been difficult to get adequate support services for Peruvian farmers, or to build consumer markets for high-value foods.

Aid funds provided part of the support for De Soto's groundbreaking research work. Is there a next step for development aid in making sure that enough additional licenses are issued to ensure competition in support services for Peru's farm sector? Would that approach work in other countries?

Dr. Anne Kreuger, late of the World Bank, recently told a State Department audience that debt has been less of a growth constraint on Latin America in the 1980s than inadequate economic reform; she characterized the economic reforms that have been made as "palliative."

It is no indictment of development aid to say that it has failed to transcend the constraints of anti-growth environments in many less-developed countries. Nor is it an indictment of particular countries or cultures. The young United States had a weak government under the Articles of Confederation; it took us decades to draft and

adopt our Constitution. British investors in our early canals and railroads found to their sorrow how quickly their capital could disappear in America's new and thus high-risk frontier economy.

If development aid is to have a future role in the third world's development, however, it must find better ways to make impacts in countries with weak institutions and cultural patterns not yet adapted to taking full advantage of modern economic growth potentials.

The World Bank still talks bravely of "keeping resource transfers flowing" despite strong evidence that no good comes from pouring money, goods, and services into economies that cannot put them to constructive use. Too often, even appropriate investments are overwhelmed by the negative context surrounding them.

Developing countries themselves have often taken aid grants as tributes to their political importance rather than as true development assistance. Few less-developed countries have welcomed the recent trend among donors toward aid conditioned on policy reform and relatively little policy reform has yet been produced.

Perhaps it is time to rethink the linkages between aid and recipient governments. Virtually all development aid has been channeled noncompetitively through those governments. Recently we have gone so far as to award some aid competitively between governments, on the basis of their relative willingness to make needed economic reforms. Can we constructively go farther? Can we direct more aid through other types of institutions where a competitive environment and greater incentives for effective development can be fostered? What about aid relationships with institutions closer to the rural resources than the national governments? The World Bank recently made a loan to a forest products firm in Guyana which it concluded was a more effective loan recipient than the government. The Bank simply made it clear that the government's choice was between a loan to the company and no loan in the country at all. What about loans or grants to farmer cooperatives (not government-established shells but living cooperatives actively run and owned by the producers)? What about loans to tribes, villages, or regions? Charitable organizations? Seed multiplication companies? Grain storage firms? Even exceptional individuals with special skills and opportunities?

Obviously, such a change in lending and development aid programs would mean some significant changes in the programs and their administration. It would probably mean smaller projects, depending less on central administration. It would mean a much less cozy relationship with the recipient national governments. Instead of trying to shift large amounts of resources to recipient governments, the new focus might be "seed money" to stimulate

savings, investments, and sweat equity by millions of rural individuals.

Such a new approach might mean heavier reliance on grants, less administrative stress on monitoring how the money is used in the short term, heavier stress on producing results.

Such a shift would of course involve a different concept by donor governments, too. Donor countries often target their aid on the basis of political commitments (U.S. aid to Egypt, EC aid to former French colonies) rather than targeting it on the best economic development prospects. Donor countries often give aid designed to increase their trade prospects with the developing countries involved.

Maintaining past illusions in both donor and recipient countries has yielded slow development progress, with a great deal of wasted money and effort. In fact, if the limitations of past development aid are not overcome, the whole aid effort may be threatened by public apathy and competitive hostility. For the sake of the development effort, the people it could help directly, and the well-being of the whole world, we need to do better.

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DEVELOPMENT ASSISTANCE AND TRADE: THE WAY IT WAS, THE WAY IT IS, AND WHAT THE DIFFERENCE MEANS

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During the past decade economic assistance to other nations has come under increasing criticism from U.S. agricultural interests. At the same time, there is growing evidence that the economic growth and development of developing countries expands export markets for U.S. agricultural products. Parallel to this apparent inconsistency is a growing trade-protectionist sentiment in the United States that coincides with strong U.S. policy support for the new General Agreement on Tariffs and Trade (GATT) negotiations that are designed to reduce trade barriers. How do we account for this strange behavior?

The relative economic position of the United States in the global economy in the late 1980s is very different than during the early 1950s when GATT was young and U.S. development assistance programs were initiated. This paper investigates the changed role of the United States in the world political economy and how the economic basis for U.S. development assistance to other nations has been changed by the altered global, political, and economic positions of the United States as the world moves into the 1990s and the next century.

Conceptually, the relationship between development assistance, economic growth, trade, and U.S. welfare is straightforward. Development assistance increases a recipient country's rate of economic growth over what it would be without development assistance. As the country grows and develops economically it increases its trade in general and, presumably, with the United States as a part of its trade expansion. Finally U.S. welfare is increased by expanded trade, either directly or indirectly, with the developing country (see figure 1). Thus, logically it would seem to follow that the stronger the relationship between development assistance expenditures and enhanced U.S. welfare the stronger the support

for increased development assistance and expanded trade.

Our approach is to consider first the antecedents of U.S. development assistance and trade policies. As this analysis shows, U.S. development assistance and trade policies have been heavily influenced by international political and security concerns. We then posit three conditions that, when taken together, relate a country's development assistance to its own welfare:

1. Development assistance increases the rate of economic growth and development of a recipient country over what it would be without the development assistance.
2. As countries grow and develop economically, they increase the volume and commodity composition of their foreign trade, and some share of this expanded trade, either directly or indirectly, is with the United States.
3. Expanded U.S. trade increases U.S. welfare.

This analysis concludes that, whereas much has been learned about the relationships among economic growth, development assistance, and the welfare gains from trade, the theoretical foundations for arguing that international trade always benefits a country have become flawed. While ongoing theoretical developments can be expected to contribute to repairing this flawed foundation, it will undoubtedly be some time before a commonly accepted theory that explains the relationship between a country's trade growth and its welfare emerges. In the meantime, free trade as a policy has shifted from an optimum to a reasonable rule of thumb, and other supplemental arguments to defend and justify an open international trading environment may have to be developed.

LESSONS LEARNED SINCE WORLD WAR II

The United States and the developing countries occupy very different positions in the world political economy in 1988 than they did in the two decades following World War II. (This section draws heavily on the work of Spero, 1981.) The United States was the only global power that survived World War II undamaged. At war's end, the U.S. share of world gross national product (GNP) was an astounding 50%. While the United States still has a profound influence on economic developments in the rest of the world, U.S. GNP accounted for only about 20% of world income in 1983 (Sachs, unpublished paper). U.S. exports made up nearly 20% of world exports from 1951 to 1955, but accounted for only slightly over 10% in 1981-85 (Mackie, 1983, and personal correspondence). In the 2 decades following World War II the United States was the undis-

puted leader in providing development assistance to the developing countries. In 1986, while still the largest donor, U.S. assistance accounted for only 26% of the total assistance provided by the Organization for Economic Cooperation and Development (OECD) and OPEC members (World Bank, 1987). Clearly, while it still occupies a position of formidable strength in the international economy, the United States is no longer the sole dominant power with the ability to shape the international economic order as it wishes.

For the West a fundamental change has occurred in the political environment since the end of World War II. With the outbreak of the Cold War at the end of the 1940s, the West, concerned that its internal weakness made it vulnerable to internal Communist threats and to external pressure from the Soviet Union, tended to subordinate economic conflict. A very high priority was placed on economic cooperation, not only to rebuild Western economies, but to ensure their continued economic vitality and their political and military security. Thus, during the two decades following World War II, the developed countries had a common concern with their survival that facilitated their reaching a consensus on economic policy. Today, with their internal strength secure, and the external threat of Communism much reduced, the developed countries no longer have the common concern they once had in reaching a consensus on economic policy. While foreign policy objectives are still important, they are not sufficient to overcome national economic interests. In the United States, and in other developed countries as well, economic interest must also be satisfied. Thus, foreign market development and national welfare have become relatively more important national objectives.

Many of the developing countries immediately following World War II were still colonies attached to Western imperial powers. By the end of the second decade following the war, most had become independent states, and today a number have become significant participants in the international economy. In a book published in 1985, John Sewell, president of the Overseas Development Council, points out that in the 1970s the 40 most advanced developing countries added more to the increment of world growth than did the United States or Japan and Germany combined (Preeg, 1985). Sewell further noted that developing countries now account for 25% of world trade and are producing increasingly sophisticated products such as ships, steel, and petrochemicals. They have become major markets for the U.S. economy and account for nearly 40% of U.S. exports. Ten of the largest U.S. trading partners in 1984 were developing countries (Preeg, 1985). These 10 countries were markets for 21% of U.S. exports and provided 25% of U.S. imports.

GNP growth between 1965 and 1986 averaged two percentage points greater in the developing than in the developed countries (World Bank, 1987). Thus, while there is still a considerable gap between the level of development of the developing and the developed countries, the influence of the developing countries on the international economy can no longer be ignored. Not only has the effect of these economies on the international economy become significant, but it is likely to become more so in the future.

Our knowledge of economic growth and development, and the role that development assistance plays in accelerating the process, has increased significantly. (This section draws heavily on Krueger and Ruttan, 1983.) In 1959 Benjamin Higgins wrote in the preface of his book on economic development

> At this point in the history of economic thought,...the range of agreement on economic development is extremely narrow. In the case of the underdeveloped areas, economists are particularly aware of deficient knowledge...the pressure to discover effective means of launching economic growth is compelling economists to reconsider their concepts of the scope and method of economics. Economists are being forced into a whole galaxy of peripheral fields in which they are somewhat unsure of their footage. Not since the crash of 1929 have professional economists faced more urgent demand for answers to pressing policy questions; and not since the crash have they been so inadequately equipped to answer the questions put to them.

It was eight years later (1967) that Albert Hirschman wrote in his book

> Much remains to be done in understanding the conditions for success and failure of [development] projects...

In contrast, in 1983 after discussing a long list of lessons learned, Krueger and Ruttan concluded that

> ...understanding of the development process has increased. As it has increased, the effectiveness of aid efforts has increased. There can be little doubt that donor agencies (and officials in recipient governments) have a greater understanding of the development process now than their counterparts did twenty or thirty years ago.

In 1985 Cassen & Associates wrote

> Since so much has been said about the learning process, the points that occur through the report will also bear repetition: that a great deal of learning has gone on. In whole ranges of [development] project types—roads, irrigation,

integrated rural development, health, nutrition, education, family planning—what is done by aid today has changed radically in the light of experience.

Clearly, in the over 40 years since the end of World War II, we have learned a great deal about economic growth and the role of development assistance in promoting such growth. The degree to which this increased knowledge has been incorporated into U.S. development assistance programs is not addressed directly in the literature. The presumption seems to be that new knowledge is automatically brought to bear on the design and execution of new projects. However, the validity of this presumption may deserve further consideration.

The high economic returns to some development assistance projects has led to the general professional consensus that development assistance plays an important role in accelerating the rate of economic growth and development of recipient countries. The lack of empirical support for a strong relationship between development assistance and economic growth is attributed to the large number of other variables that affect economic development and the varied and significant time lags between the time when development assistance is given and when it affects a country's economic growth. Moreover, development assistance accounts for only about 2% of the capital investment available to less developed countries for development purposes. There is, however, general agreement supported by theory and empirical analysis that economic growth is a function of saving and investments and, in this context, both theory and empirical analysis support the proposition that development assistance increases a country's rate of economic growth and development.

While we have learned much about economic development and foreign assistance, it would be a mistake to conclude that there are no new lessons to be learned. The gaps in our knowledge led Krueger and Ruttan in 1983 to say

> ...There is a dearth of information that systematically evaluates the effect of technical assistance efforts in raising productivity in individual countries or in individual sectors across countries. ...In general, evidence about how aid promotes efficiency, through technical assistance or through the introduction or spread of more productive technology, training or other mechanisms that tend to raise factor productivity, has not been systematically studied. It would appear that an important area of future inquiry on the impact of assistance should be its effect on productivity.

The very substantial increase over the past 30 to 40 years in our knowledge of the economic growth and development process, and the role that development assistance can play in accelerating the process, has both positive and negative dimensions. On the positive side we can be more confident that appropriate development assistance activities will yield high returns. Many of the past mistakes can be avoided, and investments can be focused on the activities that have a much higher probability of succeeding. On the negative side the danger is that our increased knowledge will lead us to inaction.

We now know the prerequisites for different types of development assistance projects. For example, improved agricultural technologies that are adapted to local conditions are a prerequisite for the development of an effective agricultural extension service. However, the magnitude of the investment required to develop the prerequisite may be intimidating. In his discussion of development projects Hirschman describes the problem as formulated by the economic historian John Sawyer:

> ...Underestimates of cost resulting from 'miscalculation or sheer ignorance' were, in a number of great and ultimately successful economic undertakings ...'crucial to getting an enterprise launched at all.' 'Had the total investment required been accurately and objectively known at the beginning, the project would not have been begun.'

Thus, the danger is that we may be intimidated by our new knowledge of the magnitude of the prerequisites that accompany successful development projects.

After 35 years of experience with development assistance activities, it seems clear that by judiciously selecting development assistance projects, we can achieve higher returns than ever before. Whether we are prepared to face the challenges this commitment entails is another question.

Economic and trade growth are positively and highly correlated, but the factors that explain this high correlation are different than originally thought (Krugman, 1987). United States development assistance during its early years was framed in a Heckscher-Ohlin world where the common view was that differences in factor endowments led to international trade. In this framework trade leads to an increase in the real income of a country's scarce factor. Thus, it was thought that since in developed countries capital was relatively abundant, and labor was relatively scarce, trade would lead to a decrease in real income of owners of labor and an increase in the real income of owners of capital. It was commonly agreed that it would be difficult to redistribute the gains of the owners of

capital to offset the losses of the owners of labor, and that for this reason labor unions in developed countries would tend to oppose free trade and favor trade protectionism. This, and the assessment that opportunities for inter-industry trade were limited, were the basis for assuming that global trade during the post World War II period would grow relatively slowly.

However, growth in world trade since World War II did not conform to expectations. Since 1950 world trade has consistently grown much more rapidly than GNP. Since 1950 the world index of manufactured exports has increased 200% more than the world index of manufactured output (World Bank, 1987). This discrepancy and the resulting reexamination of trade theory have left the theoretical explanation of the relationship between economic growth and trade inconclusive. Currently a number of partial theoretical explanations exist—increasing returns to scale, differentiated products, technology gaps, product cycles—but no unified theory has emerged.

In a recent article entitled "Is Free Trade Passé?", Krugman (1987) discussed the extent to which the unanswered questions have shaken the sacred free trade foundation of trade theory:

> ...The case for free trade is currently more in doubt than at any time since the 1817 publication of Ricardo's Principles of Political Economy. This is not because of the political pressures for protection, which have triumphed in the past without shaking intellectual foundations of comparative advantage theory. Rather, it is because of the changes that have recently taken place in the theory of international trade itself. While new developments in international trade theory may not yet be familiar to profession at large, they have been substantial and radical.

Krugman concluded:

> Free trade is not passé, but it is an idea that has irretrievably lost its innocence. Its status has shifted from optimum to reasonable rule of thumb. There is still a case for free trade as a good policy, and as a useful target in the practical world of politics, but it can never again be asserted as a policy that economic theory tells us is always right.

The rationale underlying this analysis is that U.S. development assistance leads to accelerated economic growth on the part of developing nations, that the accelerated economic growth of these nations expands their trade and either directly or indirectly leads to increased U.S. trade, and that U.S. welfare is increased through the increased economic gains associated with its expanded trade. The theoretical and empirical evidence is that development assistance

contributes to accelerating the economic growth of developing countries and that these countries increase their trade as they grow economically. But the welfare consequences of increased U.S. trade associated with the economic growth of the developing countries are unclear due to the indeterminant status of trade theory. (This section draws heavily on Krugman, 1987; where relevant, specific parts of the article are cited.)

In a Heckscher-Ohlin world where trade growth is driven by increased intra-industry trade, welfare consequences are clear. Intra-industry trade accounted for over 50% of industrial country trade when Grubel and Lloyd published their pioneering study in 1975. However, in a world where trade growth is driven by increased intra-industry trade, the welfare consequences are not clear. As Krugman (1987) points out, while a country may gain from free trade based on imperfect competition and increasing returns, there is no guarantee that the benefits from free trade will be realized in a second-best world of imperfect competition. Helpman (1981) in his recent survey article on increasing returns, imperfect markets, and trade theory writes

> Apart from demonstrating the possibility of multiple equilibria, this example brings out another important feature of models with internationally increasing returns to scale; under these circumstances an economy may lose from free trade.

In other words, the economic gains from free trade may be more than offset by the economic losses from the nonoptimal use of resources under monopolistic competition.

It will undoubtedly be some time before a commonly accepted theory that explains the relationship between a country's trade growth and its welfare emerges. In the meantime, other arguments to defend and justify a country's trade growth may have to be developed.

The new view of international trade, which holds that to an important degree trade is driven by economies of size rather than comparative advantage, suggests two arguments against free trade (Krugman, 1987): One, an old idea that government policy should favor industries that yield positive externalities, and two, a new idea that holds that government policy can tilt the terms of oligopolistic competition to shift excess returns from foreign to domestic firms. Krugman argues (1987) that whereas the new trade theory, with increasing returns to size as the force that drives trade growth, has met with remarkably quick acceptance in the profession, the conclusion that this justifies a greater degree of government intervention has met with sharp criticism and opposition—not least

from some of the creators of the new theory themselves. He summarized the criticism of his fellow professionals:

> First, critics suggest that it is impossible to formulate useful interventionist policies given the empirical difficulties involved in modelling imperfect markets. Second, they argue that any gains from intervention will be dissipated by entry of rent seeking firms. Third, it is argued that general equilibrium considerations radically increase the empirical difficulty of formulating interventionist trade policies and make it even more unlikely that these policies will do more good than harm.

He then argued the case for free trade:

> The well-justified concern of economists is that when policies affect income distribution, the politics of policy formation come to be dominated by distribution rather than efficiency. In the case of interventions, this concern is at two levels. First, to the extent that the policies work, they will have a beggar-thy-neighbor component that can lead to retaliation and mutually harmful trade war. Second, at the domestic level an effort to pursue efficiency through intervention could be captured by special interests and turned into an inefficient redistributionist program.

After World War II the Heckscher-Ohlin explanation of trade provided an internally consistent set of theorems that could be used to defend free trade. Today, a policy of free trade cannot be justified on the basis of such a unified and integrated set of economic theorems, and until such a theory is developed, we need to be careful about recommending a policy of free trade in specific situations.

INTEGRATION OF DOMESTIC AND INTERNATIONAL POLICIES

It can be argued that the international economic order that has prevailed since the end of World War II has been either a significant success or a tremendous failure. On the negative side, it is a fact that 45% of the world's population receives only about 5% of the world's income, and that in 1985 the per capita income of the low income countries was only 2.3% of the per capita income of the highly developed countries (World Bank, 1987). Certainly, the United States has not achieved the goals of its development assistance program as they were laid out in the mid-1950s:

> ...That a sustained program of American economic assistance aimed at helping the free underdeveloped countries to create the conditions for self sustaining growth can, in the short run, ...say in two to three decades, result in an overwhelming predominence of societies with a successful record of solving their problems without resort to coercion or violence. [And that] ...such a preponderance of stable, effective and democratic societies gives the best promise of a favorable settlement of the Cold War and of a peaceful, progressive world environment. (U.S. Senate, 1957).

Yet there is a record of success that cannot be denied. The failures of the 1930s, when beggar-thy-neighbor policies such as high tariffs and competitive devaluations contributed to economic breakdown, domestic political instability, and international war, have not been repeated, at least not on a global scale. John P. Lewis, in a recent overview of development strategies, points out that from 1960, when many of the African countries became independent, through 1982, the gross domestic products of all the low and middle income developing countries had an average annual real growth rate (population weighted) of 4.8% (Lewis, 1986). Moreover, if Japan's run away growth (10.4% a year) is excluded from the OECD average, the OECD countries grew at an annual rate of 4.1%, significantly less than the rate of growth of the low and middle income countries. Lewis also points out that China and India, two giants that account for two-thirds of the total population of the entire developing world, have become substantially self-sufficient in food after a history of droughts, floods, and food deficits. That these two countries seem to be building up a good deal of productive momentum is a matter of great global significance. Finally, as noted earlier, through their increased trade, a number of developing countries have become significant participants in the international economy. As a group, in 1985 developing countries accounted for over 25% of world trade (excluding the trade of the Soviet Union and the Eastern European countries) (World Bank, 1987).

Three major conclusions can be drawn from this mixed record of success and failure. First, much remains to be done. With nearly 50% of the world's population receiving about 5% of the world's income, it seems unreasonable, to paraphrase the originators of U.S. development assistance, that we have achieved a preponderance of stable, effective, and democratic societies that gives the best promise of a favorable settlement of the Cold War and of a peaceful, progressive world environment.

Second, we have learned a number of very valuable lessons from our experience since the end of World War II: the critical

importance of appropriate domestic policies in promoting economic growth and development; the existence of essential preconditions for the successful execution of different types of development assistance activities; the stimulating effects of export-led growth strategies on economic growth; and the importance of an open international economy based on the free flow of capital and liberalized commodity trade. Many of these lessons could only be learned from experience; there were no precedents. With the knowledge of these lessons, and especially with the knowledge that we can learn such lessons from our experience, there is good reason to be optimistic about the future.

Third, today's international environment is very different from the international environment that dominated much of the 40-year period since the end of World War II. Perhaps the major difference is that the benefits of the international exchange of capital, technology, and of export-led economic growth have become widely recognized by national leaders. Even China and the Soviet Union have become believers. China's interest in attracting foreign investment has become well known, and, at the recent World Economic Forum in Switzerland, Ivan Ivanov, the leading Soviet diplomat in charge of foreign economic relations, said efforts were being made to cut bureaucratic red tape to accelerate the process of foreign investment in the Soviet Union through joint ventures. He indicated that 23 joint ventures had already been concluded, that 18 of those were with businesses in nonsocialist countries, that some 40 others are in the process, and that 260 additional offers are under consideration (Rowen, 1988).

Another significant difference between the international environment that dominated the post World War II period and the international environment that can be expected to prevail in the future is the number of significant participants in the international economy. Not only have a number of developing countries become important participants through their increased international trade, but the centrally planned socialist economies, which isolated themselves from the international economy during much of the period following World War II, have become interested in expanding their involvement in the international economy.

Still another significant difference between the international environment of the post World War II period and the future environment is that no one country, including the United States, is in a position to dominate the management of the international economic order. This situation places an increased emphasis on "management by committee," and while this has its strengths, it has definite limitations.

Today's very different international environment provides both opportunity and challenge. For the 25-year period 1961 to 1985, the world economy grew at an average annual rate of 3.8%; 9 of the 25 years it grew at a rate of 5% or more; and for 14 years it grew at an average rate of 4% or more. During the same period developing countries as a group grew at an average annual rate of 4.8%, and during 13 of the 25 years at 5% or more, and during 19 of the 25 years at 4% or more. Clearly, this is a solid record that provides a strong basis for promoting an open international economic system based on the unrestricted exchange of capital, technology, and commodities.

The major challenge of today's very different international environment is how to sustain the system in the face of the increased potential for policy conflict. The increased number of developing countries that are significant participants in the international economy, and the more extensive linkages of developed country economies to the international economy, increase the potential for conflict in five specific areas:

1. How to coordinate the domestic policies of individual countries when such coordination requires significant domestic adjustments that benefit some countries and harm others.

   A country's fiscal and monetary policies affect its interest rate and the value of its currency. Hence, under a flexible exchange rate system, the competitiveness of a country's products in international markets is affected by changes in its domestic macroeconomic policies. It follows that one country's domestic macroeconomic policies affect the relative competitiveness of another country's products in international markets and vice versa.
2. How to sustain an open international trading environment as the vulnerability of national economies increases with their increased involvement in the international economy.

   While net gains from trade are often very significant, the absolute gain is normally diffused over many consumers and the absolute loss concentrated on a relatively small number of producers, often in very localized geographic areas. Thus those resisting are often much more visible than those promoting free trade as a policy.
3. How to harmonize the domestic and international policies of individual countries—when such harmonization requires significant domestic adjustments that benefit some domestic interests and harms others.

   An overvalued currency benefits a country's consumers of imported goods, decreases the international competitiveness of a country's export industries, and vice versa. Thus, producers of

export products view an overvalued exchange differently than consumers of imported products. Moreover, the shift to a variable exchange rate system in 1973 increased the uncertainty over how competitive a country's products are in international markets. It seems likely, also, that the variable exchange rate system has increased the instability of the international market, further exacerbating the resource adjustment problems of export production.

4. How to coordinate development assistance programs and trade policy to achieve an optimum combination of objectives related to contributions to host country economic development, U.S. geopolitical and foreign policy interests, and enhancing U.S. market development and trade interests such that they result in increased U.S. welfare.

   The development assistance and direct international private investment of a country affects the relative international competitiveness of the products of both the donor and recipient country. Thus, a country's products may become more or less competitive in international markets as a result of these two forms of resource transfer, and selected groups in both the donor and recipient country may gain or lose. While absolute gains may be much greater than absolute loses, if some of the gain is not redistributed to offset losses of those who lose, policies that support the economic growth and development of other countries through the use of development assistance and private direct international investment may be difficult to defend.

5. How to manage the international economy, through coordination of international economic policy, to create a stable global environment within which all countries can grow, prosper, and gain from economic interaction with their global neighbors.

   The potential for policy conflict, and the difficulty of resolving the conflicts, has increased since the end of World War II. Net flows of official development assistance increased over 5 times, and net flows of private financial resources over 14 times between 1960 and 1982 (IMF, 1985). In 1982 net flows of official development assistance from industrial countries to developing countries were $27.9 billion, or one-third of the total net flows of financial resources from the industrial to the developing countries.

Official development assistance is still important to the growth and development of the developing countries. At the same time, the increased potential for policy conflict could leave development assistance, and the free flows of resources and commodities, as scapegoats in our decreased ability to resolve the policy conflicts. As policy planners and researchers our best approach is to address

the potential conflicts with analysis and debate on the potential conflicts themselves. Solid analyses of who gains, and who loses, in the international transfer of resources, technology, and commodities would be a beginning.

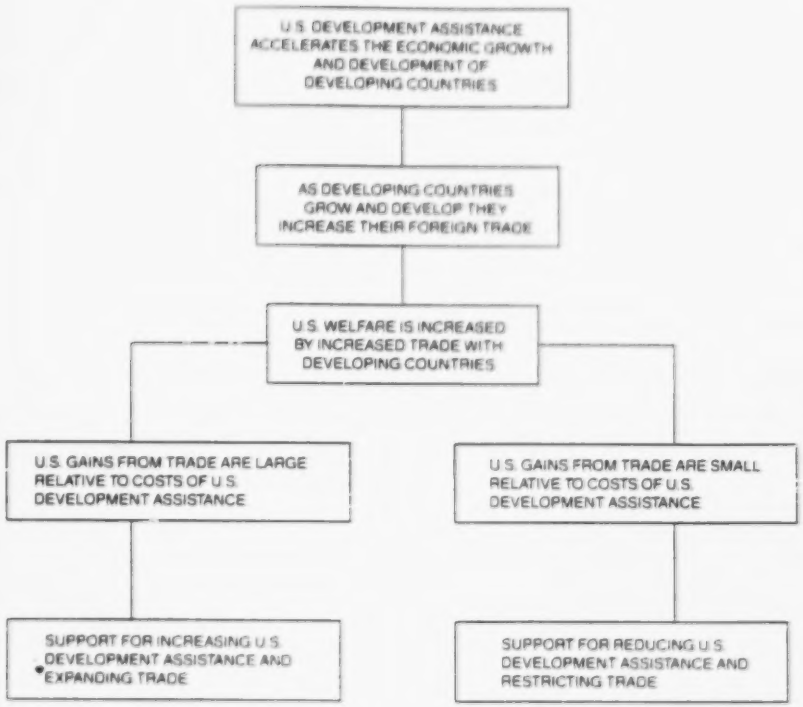
U.S. DEVELOPMENT ASSISTANCE ACCELERATES THE ECONOMIC GROWTH AND DEVELOPMENT OF DEVELOPING COUNTRIES
AS DEVELOPING COUNTRIES GROW AND DEVELOP THEY INCREASE THEIR FOREIGN TRADE
U.S. WELFARE IS INCREASED BY INCREASED TRADE WITH DEVELOPING COUNTRIES
U.S. GAINS FROM TRADE ARE LARGE RELATIVE TO COSTS OF U.S. DEVELOPMENT ASSISTANCE
U.S. GAINS FROM TRADE ARE SMALL RELATIVE TO COSTS OF U.S. DEVELOPMENT ASSISTANCE
SUPPORT FOR INCREASING U.S. DEVELOPMENT ASSISTANCE AND EXPANDING TRADE
SUPPORT FOR REDUCING U.S. DEVELOPMENT ASSISTANCE AND RESTRICTING TRADE

Figure 1. Conceptual framework for analyzing the relationship between U.S. development assistance and trade.

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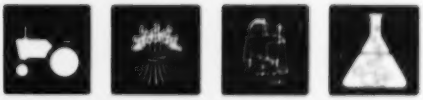

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